PERSUASION AWARENESS IN ONLINE SETTINGS: ANTECEDENTS, CONSEQUENCES, AND TRANSPARENCY MECHANISMS

by

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Abstract

With the continued growth of technologies, persuasion practices in online settings are on the rise. However, the use of technologies is a double-edged sword. Technologies can influence users without their awareness of being persuaded, making users more vulnerable to such influence. As technologies have been embedded throughout online platforms and provided more insights about their users, there is a major possibility of persuading users via technology design. Thus, the likelihood of being persuaded without awareness will increase. However, extant literature posits perceived persuasion beliefs can also promote careful evaluations and decisions (Friestad and Wright 1994). Despite its importance, persuasion awareness has received little attention in IS research. To this end, I attempt to address the following questions: *What are the key features of persuasive design which influence online users' persuasion awareness? How do persuasive design features affect users' persuasion awareness and behavioral responses? What are the mechanisms which improve users' persuasion awareness?*

To answer these questions, I propose a theoretical model of persuasion awareness in online settings and empirically investigate it in an e-commerce context in empirical study 1 and 2. Relying on the Decision Support System literature and Toulmin (2003), I identify two *forms* of persuasive design features (PDF)—*suggestive* and *supportive*—and analyze the suggestive form in terms of its *content*, *mode*, and *invocation style*. I apply the Persuasion Knowledge Model to outline how users perceive and respond to persuasion attempts triggered by online entities, and identify transparency mechanisms, specific ways in which entities can be designed to influence users' persuasion awareness. An integrated model and a typology of PDF are discussed in Chapter 3. Study 1 (Chapter 4) reveals that suggestive content affects perceived persuasion and assistance beliefs,

which, in turn, shape users' responses. Also, only perceived persuasion increases careful evaluations of targeted products. Study 2 (Chapter 5) adds persuasion transparency information disclosing persuasion tactics online entities use. Results demonstrate that persuasion transparency enhances perceived persuasion and dampens perceived assistance. Thus, persuasion transparency improves users' persuasion awareness. Overall, this thesis serves as an initial step toward understanding online persuasion awareness that promotes users' informed evaluations and decisions.

Lay Summary

This thesis includes one theoretical model and two empirical studies which address persuasion awareness in online settings, an emerging topic in the information systems (IS) domain. In Chapter 3, I propose a theoretical model detailing how technologies can be designed to shape online users' perception of being influenced and how users respond to such designs. This proposed model is subsequently investigated in the context of an e-commerce website in empirical study 1 (Chapter 4) and study 2 (Chapter 5) using online experiments. In empirical study 1, I developed an experimental website to examine how suggestive content will affect users' persuasion awareness and behavioral responses. In empirical study 2, I created a website page disclosing persuasion tactics, called persuasion transparency information, to improve or dampen users' persuasion awareness. In sum, this thesis aims to strengthen researchers' understanding of online persuasion awareness, provide online designers with a guideline to enhance users' informed judgments and decisions, and open avenues for future research.

Preface

This thesis is an original intellectual work of the author, P. Tangwaragorn, under the supervision of members of the supervisory committee, Professor Benbasat, Professor Cenfetelli, and Professor Hoegg.

Chapter 2 and Chapter 3 (a theoretical model): Professor Benbasat, Professor Cenfetelli, and I identified the research idea together. I systematically reviewed the literature in relevant disciplines, developed a theoretical research model, and proposed hypotheses. Professor Hoegg provided advice.

Chapter 4 (empirical study 1): Under the supervision of Professor Benbasat and Professor Cenfetelli, I was the primary investigator who designed the experiment, developed an experimental website, conducted pretests and main experiments, and analyzed data. Professor Hoegg gave advice. A version of Chapter 4 was presented at DIGIT 2018, Tangwaragorn, P., Cenfetelli, R., and Benbasat, I. 2018. "Investigating the Effect of Persuasive Design on Online Users' Persuasion Awareness," DIGIT 2018 Proceedings, San Francisco, USA. I wrote and revised the manuscript. Professor Benbasat and Professor Cenfetelli provided feedback and edited the manuscript. The experiment described in this chapter received approval from the Behavioral Research Ethics Board of the University of British Columbia, certificate number: H18-00239.

Chapter 5 (empirical study 2): I was responsible for designing the experiment, building an experimental website, running pretests and main experiments, and analyzing data, in consultation with Professor Benbasat and Professor Cenfetelli. Professor Hoegg gave advice. Approval from

the Behavioral Research Ethics Board of the University of British Columbia, certificate number:

H18-00239, was obtained for the experiment explained in this chapter.

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List of Abbreviations

AI   Artificial Intelligence

ANCOVA   Analysis of Covariance

ANOVA   Analysis of Variance

IS   Information System

MANCOVA   Multivariate Analysis of Covariance

MANOVA   Multivariate Analysis of Variance

N/A   Not Available

PDF   Persuasive Design Feature

PKM   Persuasion Knowledge Model

PLS   Partial Least Squares

RA   Recommendation Agent

Glossary

Active timing	Transparency information that is shown upon users' request
Advance timing	Transparency information that is given to users before their exposure to a persuasive design feature (PDF)
Agent information	Information regarding an online entity or a sponsor
Agent knowledge	Users' beliefs concerning an online entity's competencies and goals (competent and benevolent trusting belief)
Attitudes	Users' evaluations of an online entity or the design of such entity
Automatic style	The suggestive form of PDF that is given to users automatically
Backing	The suggestive form of PDF that features information used to explain why a warrant or data should be accepted
Behavioral Responses	Users' responses to a PDF

Claim	The suggestive form of PDF that features a conclusion, action, recommendation, or standpoint
Cognitive capacity	Users' cognitive availability to engage in processing information presented by online entities
Cognitive responses	Users' cognitive responses to a PDF, such as resistance, attitudes towards the design of an online entity, and intention to interact with an online entity
Content	What content the suggestive form features
Data	The suggestive form of PDF that features a fact
Decision support system (DSS)	System design to support users' decision-making
Delayed timing	Transparency information that is present to users after their exposure to a PDF
Form	What a PDF an online entity offers to users
Intention	Users' intention to interact with online entities in the future
Invocation style	How the suggestive form of PDF is triggered

Mode	How the suggestive form of PDF is constructed
Non-personalized mode	Content of the suggestive form that is predefined by an online entity
Not-suggestive PDF	A component of an online entity that does not offer an explicit or implicit direction regarding what to do to users
Objective responses	Users' observable responses to a PDF, such as careful evaluation of a PDF, acceptance, and rejection
On-demand style	The suggestive form of PDF that is triggered upon users' request
Online entity	An entity that delivers persuasive design features to users in an online setting
Online user	An individual who interacts with an online entity
Passive timing	Transparency information that is available together with a PDF
Perceived agent benefits	Users' perception that an online entity benefits from them

Perceived agent cost	Users' perception of an online entity's time or effort used in delivering a PDF
Perceived appropriateness	Users' perception that an online entity that provides a PDF is acceptable
Perceived assistance beliefs	Users' perception that an online entity helps them to fulfill their own goals
Perceived assistance intent	Users' perception that an online entity tries to help them
Perceived personalization	The degree to which users perceive that an online entity understands and represents their needs
Perceived persuasion beliefs	Users' perception that an online entity tries to persuade them to fulfill its goal
Perceived persuasive intent	Users' perception that an online entity persuades them
Perceived user benefits	Users' perception that they benefit from interacting with an online entity
Perceived user costs	Users' perception of their attention, processing effort, or involvement used in processing a PDF

Personalized mode	Content of the suggestive form that is based on learning user preferences.
Persuasion	An attempt to influence individuals' attitudes and/or behaviors
Persuasion awareness	Users' perception that an online entity tries to influence them
Persuasion information	Information concerning persuasion tactics used in a PDF
Persuasion knowledge	Users' beliefs regarding persuasion tactics an online entity employs
Persuasion rule/tactic	A strategy used by online entities to influence their users
Persuasion target information	Information regarding targets of a PDF
Persuasive design feature (PDF)	A component of an online entity that influences and facilitates users to perform a targeted outcome

Persuasive technology/design/system	An interactive system designed to change attitudes and/or behaviors of users without using coercion or deception
Quasi-suggestive PDF	A component of an online entity that does not give an explicit direction on what to do to users, but from which users can infer a direction
Reactance/resistance	Users' perception that their freedom of choice is threatened by an online entity
Suggestive form	The degree to which an online entity provides an explicit direction on what to do to users, ranging from not suggestive to quasi-suggestive to suggestive
Suggestive PDF	A component of an online entity that offers an explicit direction concerning what to do to users
Supportive form	A function that an online entity offers to support users' evaluations and decisions
Targeted product consideration	Whether users view a targeted product in more detail and/or compare a targeted product with other products
Targeted product selection	Whether users select a targeted product

Topic information	Information regarding a topic of persuasion
Topic knowledge	Users' beliefs regarding the topic of persuasion
Transparency information	The information which transparency mechanisms provide to influence user's perception of being persuaded
Transparency mechanisms	Specific ways in which an online entity can be designed to influence the degree to which users are aware of being influenced
Transparency timing	How transparency mechanisms are triggered
User knowledge	Users' beliefs
Warrant	The suggestive form of PDF that features a proposition linking data with a claim

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I owe particular thanks to the MIS faculty for delivering the amazing courses that have advanced my research knowledge and providing useful comments on my research. I would like to thank the Ph.D. program administrator, Elaine Cho. Without her continuous and prompt support, I could not have navigated through my Ph.D. program smoothly. My gratitude also goes to my Sauder friend, Wenyi Xia and Paula Chang, and my MIS colleagues, Daniel Papania, Amin K. Amiri, Hongki Kim, Ruijing Zhao, and Rui Cao, among others. They have made my Ph.D. life more enjoyable.

Lastly, special thanks are owed to my parents, Charay and Supranee Tangwaragorn, and my brother, Apirak Tangwaragorn, who have always loved and supported me throughout my years of education.

To my parents, Charay and Supranee Tangwaragorn, for their unconditional love and support through my ups and downs

Chapter 1: Introduction

1.1 Research Motivation and Research Questions

With the continued growth of technologies (Burke et al. 2020), persuasion practices in online settings are on the rise. These technologies have been created and used to support users through decision support and personalization (Burke et al. 2020). Thus, across online platforms and applications, technologies are increasing their influence on users' judgments and decisions (Kim and Duhachek 2020). Such influence can be either good or bad, or both, for users. For example, Facebook uses technologies such as Artificial Intelligence (AI) to gain information regarding users' preferences and behaviors, thus providing promising ways to influence users, such as for suicide prevention (Isaac 2016). This can be good for users. However, Facebook adopts technologies to deliver personalized content, specifically targeting ads about products, elections, and politics, to users (The New York Times 2020). A recent report by Stackla (2019) echoes the importance of AI and personalization. That is, more than 50% of B2C companies in Australia, the UK, and the US plan to increase their marketing investment in AI and personalization technology. Another report by Kressmann (2017) reveals that young online users liked personalized recommendations. Also, in general, approximately 50% of online US users found personalized products that fit their preferences and personalized product recommendations appealing (Periscope By McKinsey 2019). In line with these results, prior research found positive effects of personalization on users' trust perceptions and behaviors (e.g., Komiak and Benbasat 2006). As these technologies help companies understand online users better, companies can better deliver the right content to the right users (Andrews 2017), which, in turn, will shape users' positive attitudes and behaviors (Fogg 2003). While personalization results in users' positive perceptions and

attitudes, it can benefit online platforms and companies in terms of sales. Overall, these suggest that technologies can be used to influence users.

However, there are ethical concerns associated with such technology use (Bossmann 2016). This concern has been more pronounced due to the revelation of Facebook's targeted ads sponsored by the Russian government during the 2016 US presidential election (Solon and Siddiqui 2017). According to a memo received by The New York Times (2020), Andrew Bosworth, a Facebook executive, speculated that Facebook was responsible for Donald Trump being elected in the 2016 election. He pointed out that this was due to Trump's best digital campaign in delivering good, personalized content to each user he has ever seen. According to Petty and Cacioppo (1986b), without being aware of such persuasion attempts, users did not process information carefully and thus were less likely to make careful evaluations and decisions. Facebook's users who were exposed to those targeted ads would have acted differently if they knew they were being persuaded. As Brehm and Brehm (1981) and Petty and Cacioppo (1986b) note, individuals will be more likely to resist persuasion attempts due to their perceptions that their freedom to think or behave in a certain way is restricted. In line with this notion, after the revelation of this incident to the public, Facebook has experienced trust issues and worked to regain users' trust (Bruell 2019). Overall, this incident suggests that technologies can be designed to influence users without their awareness of being persuaded. Also, this shows that whenever users learn that they were being persuaded after the fact, they will develop negative attitudes toward the persuasion agent. As a result, there is a public concern that technologies can be designed to influence users without their awareness of persuasion attempts.

Of particular interest to my research is the effect of persuasive design powered by technologies on online users' perceptions and behaviors *without* their awareness of being persuaded and the role of transparency mechanisms in enhancing their persuasion awareness. I focus on the persuasive design feature (PDF) which online platforms such as e-commerce websites, social networking sites, and applications employ to influence users' attitudes and behaviors. A persuasive design feature (PDF) is defined as a component of an online entity that influences and facilitates users to perform a targeted outcome. For instance, Netflix provides movie recommendations to users. This aims to influence their users' decisions regarding what to watch. An attempt to influence users can be perceived as either good, bad, or neutral (Gass and Seiter 2015), depending on how users interpret the goal of PDF. PDF can be designed to serve users' needs (i.e., Netflix recommends movies fitting users' preferences), their designers' interests (i.e., an e-commerce website recommends products with high-profit margins to users), or both (i.e., Facebook shows sponsored posts based on users' preferences). If users perceive that PDFs are provided to help them, they are more likely to accept such attempts (Friestad and Wright 1994). On the contrary, if they feel that PDFS are given to persuade them, they are more likely to resist or simply ignore them (Friestad and Wright 1994; Petty and Cacioppo 1986b). The important issue here is whether or not users interpret PDFs as persuasion attempts. Unless users perceive so, they are less likely to make informed judgments and decisions. As prior literature notes, when individuals know that they are being persuaded, they can engage in careful evaluations and thus informed decisions (Friestad and Wright 1994; Petty and Cacioppo 1986b). Consequently, there is a concern that PDFs can influence users without their awareness of being persuaded, leading to their less informed evaluations and decisions.

As persuasion awareness could induce individuals' reactance (e.g., Friestad and Wright 1994), the critical question is: will they need to be aware of all persuasion attempts? Will persuasion awareness be suitable only for attempts with bad intentions (i.e., with a profit goal, an e-commerce website sets a default shipping to a non-free option)? Will it be bad for those with good intentions (i.e., a doctor requests her patient to exercise, or Netflix suggests a movie a user might like)? As O'Neil (2016) remarked in her "Weapons of Math Destruction" book, "The math-powered applications powering the data economy were based on choices made by fallible human beings. Some of these choices were no doubt made with the best intentions. Nevertheless, many of these models encoded human prejudice, misunderstanding, and bias into the software systems that increasingly managed our lives." (p. 3). Thus, good intentions might not successfully be translated into an actual system. Also, the intentions of such system would be opaque or could work against users' interests. Therefore, if users are aware of being persuaded, they will be more likely to evaluate things more carefully and make informed decisions (Friestad and Wright 1994). Following this, I argue that individuals should be aware of being influenced to make informed evaluations and decisions, regardless of systems' intentions.

To the best of my knowledge, despite its importance, persuasion awareness has received little attention in IS research. As more and more companies are investing in technologies (Gartner 2016; Stackla 2019), there is a considerable potential of PDFs to persuade online users, hence increasing the likelihood of users being influenced without their awareness of such attempts. To better understand online users' persuasion awareness, I aim at addressing three specific research questions: 1) *What are the key features of persuasive design which influence online users' persuasion awareness?* 2) *How do such features affect online users' persuasion awareness and behavioral responses (i.e., forming positive/negative attitudes toward persuasion agents, careful*

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evaluation of persuasion attempts, or accepting/rejecting persuasion attempts)? 3) What are the

mechanisms which improve online users' persuasion awareness?

To answer the above questions, I first develop a comprehensive theoretical model of persuasion awareness in online settings. Specifically, I apply the Persuasion Knowledge Model (PKM, Friestad and Wright 1994) to identify persuasion awareness constructs and explain how PDFs influence users' persuasion awareness and behavioral responses. I define the "persuasive design feature" (PDF) as a component of an online platform that affects and facilitates users to perform a targeted outcome (e.g., targeted product consideration/purchase, or positive attitudes toward a political candidate). Next, building on the Decision Support Systems (DSS) literature and Toulmin (2003)'s model of argumentation, I identify the key characteristics of PDF which will trigger persuasion and shape users' persuasion awareness. Finally, drawing on PKM, I specify the aspects of transparency mechanisms which aim to enhance or dampen user awareness of persuasion attempts triggered by PDFs. The overview of my research is depicted in Figure 1.
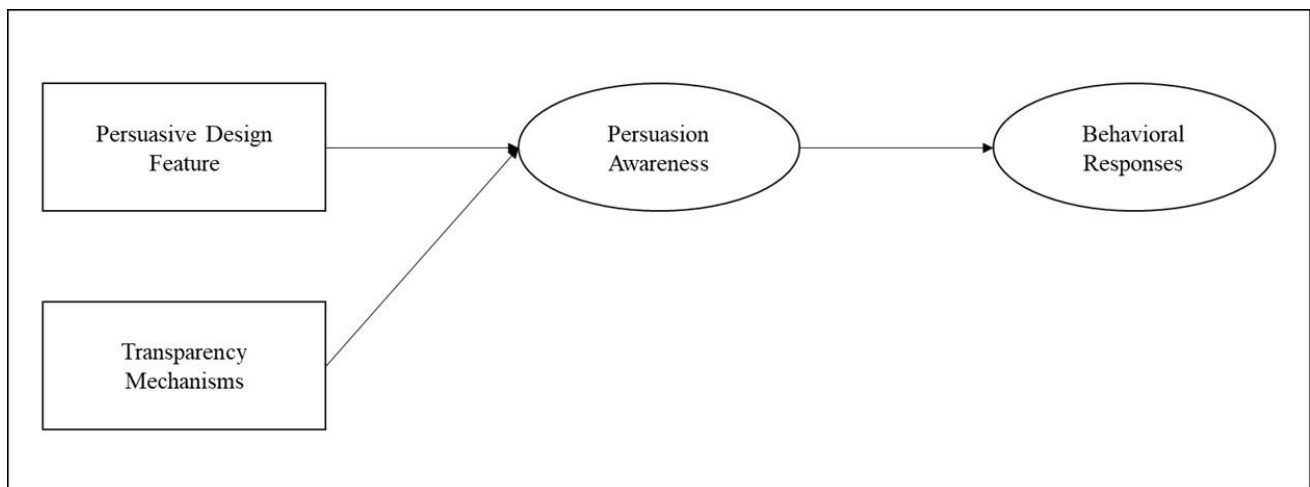
Note: Rectangles – observable constructs; ellipses – non-observable constructs

Figure 1. Research overview

As a result, the theoretical contributions of my research are three-fold. First, integrating the literature on DSS and persuasion awareness, I offer PDF as a technological determinant of persuasion awareness. In addition to the individuals' characteristics described in the traditional PKM literature and the dimensions of technology design proposed in the DSS research (Silver 2006), my thesis offers a better picture of PDF characteristics than the original PKM or DSS literature alone. It also sheds light on how users interpret persuasion attempts triggered by PDFs and respond to such efforts. Secondly, with the increasing potential of technologies in understanding users' preferences, I expect that perceived personalization will play a critical role and affect users' persuasion awareness. I add perceived personalization, which is enabled by technologies, to the traditional PKM. In particular, I propose that perceived personalization will have a positive impact on users' persuasion awareness and behavioral responses. Finally, my research proposes applicable transparency mechanisms which promote users' persuasion awareness. I provide a comprehensive theoretical model which systematically explains this phenomenon.

Additionally, from a practical viewpoint, the results of my research provide a useful guideline to design PDF and develop a transparency tool which facilitates users being better informed about persuasion attempts generated by technology design. As Facebook has developed and tested its transparency tool to increase users' persuasion awareness (Dua 2017), my proposed transparency mechanisms can help inform the design of such applications and enhance online users' persuasion awareness. Thus, this thesis serves as an initial step toward an understanding of persuasion awareness in online settings.

1.2 Outline of the Thesis

This thesis includes a literature review (Chapter 2), a theoretical model (Chapter 3) and two empirical studies—empirical study 1 (Chapter 4) and empirical study 2 (Chapter 5). The remainder of the thesis is structured as follows. Chapter 2 lays the foundation of the phenomenon. In Chapter 3, I systematically review two main bodies of research from multiple disciplines—1) persuasion awareness (e.g., Campbell and Kirmani 2000; Friestad and Wright 1994; Robertson and Rossiter 1974), 2) DSS (Silver 1990, 1991, 2006), and 3) Toulmin (2003)'s model of argumentation—and propose the integrated theoretical model of persuasion awareness in online settings and a typology of PDF. Specifically, I identify the key dimensions of PDF and explain how these dimensions influence online users' persuasion awareness and subsequent responses. This theoretical model is empirically tested in two subsequent studies in the context of e-commerce, which is one example of an application of the proposed model.

In Chapter 4 (empirical study 1), I investigate the effect of suggestive content, one aspect of PDF, on users' persuasion awareness and behavioral responses. In this study, I manipulate two content elements, claim and data, as well as their combinations. To examine the effects of these suggestive content elements, I developed an experimental website, varying in terms of suggestive content. The 532 Prolific participants were recruited. They were randomly assigned to different design conditions and then asked to complete the pre-survey questionnaire, select one product they would seriously consider purchasing from the website, and then complete the post-survey questionnaire. Results lend some support to the effect of suggestive content argued in the previous chapter. Also, this study offers a useful guideline for online designers to design suggestive content that improves users' persuasion awareness and careful evaluations of alternatives.

Chapter 5 (empirical study 2) explores the impact of persuasion transparency information on users' persuasion awareness. In particular, I manipulated "what" information an e-commerce website can provide, called *persuasion transparency information*. To evaluate the effect of persuasion transparency information, I added persuasion transparency information to the experimental website used in Chapter 4. Results of this study support how transparency mechanisms can increase or decrease users' persuasion awareness. This chapter also provides concrete design guidelines for an online website and for application designers to design transparency tools which promote users' persuasion awareness.

Chapter 6 (Conclusion) summarizes and reflects on the proposed theoretical model and two empirical studies. I also illustrate the key contributions of my thesis to researchers in IS and other disciplines and make recommendations for future research in the domain of online persuasion awareness.

Chapter 2: Literature Review

2.1 Overview

The main objective of this chapter is to obtain an understanding of persuasion awareness in online settings. I review prior research on persuasion and persuasion awareness in multiple disciplines which include communications, marketing, and information systems (IS). Also, I differentiate the two concepts, persuasion and persuasion awareness. While persuasion focuses on influencing individuals' attitudes and/or behaviors (e.g., Petty and Cacioppo 1981), persuasion awareness is about individuals' interpretation of such influence (e.g., Friestad and Wright 1994). Therefore, this chapter grounds for the development of persuasion awareness theory in online settings.

2.2 Persuasion

Persuasion is defined as an attempt to influence individuals' attitudes and/or behaviors (Petty and Cacioppo 1981). Persuasion has long been studied in psychology, communications, and marketing research. The two dominant persuasion theories are Elaboration Likelihood Model (ELM, Petty and Cacioppo 1986b) and Heuristic Systematic Model (HSM, Chaiken 1980). Both theories focus on two processes of persuasion, which include a central/systematic and a peripheral/heuristic process. In the former, an individual deliberately examines a persuasive message. Thus, the quality of the message is critical for persuasion. In the latter, an individual relies more on message cues, such as source expertise, attractiveness, or credibility, than on a message itself. In this case, the cues play more role in persuasion.

Petty and Cacioppo (1981) suggest several approaches to persuasion, such as conditioning learning, which refers to a behavioral change as a consequence of past experiences. Social

influence is one research area of persuasion that has received much attention. Social influence explains why an individual's attitude or behavior is influenced by the social other (Kelman 1958, 1961). Nudge (Thaler and Sunstein 2008) is another stream of research associated with persuasion. Nudge research focuses on how to design choices (e.g., defaults) to influence individuals' decisions to benefit them without using coercion. Therefore, there are different areas of research related to persuasion. Table 1 shows examples of persuasion-related areas of research.

Persuasion-Related Area	Definition	Source
Persuasion (attitude/behavior change)	"an attempt to change a person's mind"	Petty and Cacioppo (1981) (p. 6)
Learning	"a relatively stable change in behavior that results from prior experiences"	Petty and Cacioppo (1981) (p. 40)
Motivation	A driving force for persuasion	Petty and Cacioppo (1981)
Social influence	The social other influences attitudes or behaviors of an individual	Kelman (1961)
Nudge	"any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives"	Thaler and Sunstein (2008) (p. 6)

Table 1. Persuasion-related areas of research and their definitions

Persuasion research focuses on how and why persuasion attempts influence targeted outcomes (i.e., designing an ad's messages to increase the likelihood of product purchase). In contrast, persuasion awareness emphasizes individuals' interpretation of such persuasion attempts (i.e., whether they think that an ad's messages are trying to persuade them).

2.3 Persuasion in IS

IS researchers have paid increasing attention to the capability of technology in enabling persuasion, known as persuasive technology. Coined by Fogg (2003), the term "persuasive technology" refers to an interactive system designed to change attitudes and/or behaviors of users without using *coercion* or *deception* (Oinas-Kukkonen and Harjumaa 2008). Fogg (2003) proposes the conceptual framework which explains the role of technology in persuading users, called a functional triad. He argues that there are three roles technology can play—as a tool, a medium, and a social actor. As a tool, technology is designed to enable persuasion by increasing users' capability required to achieve targeted outcomes. As a medium, technology is developed to simulate a compelling experience which aims at influencing users' attitudes and/or behaviors. As a social actor, technology provides social cues (e.g., attractiveness, similarity, praise, and so on), which create positive relationship between technology and users, and thus shape users toward specific outcomes. Drawing from the functional triad, Xu et al. (2018) investigated the effect of a feature of a recommendation agent (RA), called trade-off transparency on perceptions regarding the three functions. The trade-off transparency showed the trade-off among product attribute values to users. They found that this feature influenced users' perceived tool, media, and social actor functionality, which, in turn, contributed to their intentions to use the system, recommendation acceptance, and recommendation to friends. Their findings indicate the role of technology in influencing users' perceptions and behaviors.

Prior IS studies have explored the design characteristics of information systems and found that these characteristics affect users' attitudes and behaviors. I preliminarily review persuasive technology research published in the eight top journals in IS including European Journal of

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Information Systems, Information Systems Journal, Information Systems Research, Journal of the

Association for Information Systems, Journal of Information Technology, Journal of Management

Information Systems, Journal of Strategic Information Systems, and MIS Quarterly from 1990 –

2021. According to multiple streams of persuasion research (see Table 1), I searched using the

following keywords—persuasion, attitude change, behavior change, learn, motivation, social

influence, and nudge—in the Web of Science database to identify persuasive technology studies.

There are 1,149 papers in total. Also, I skimmed the abstracts of these papers. Table 2 presents the

number of persuasive technology papers published in the eight journals. Table 3 presents the

number of papers based on the area of persuasion-related research.

Journal	Number of Papers
European Journal of Information Systems	194
Information Systems Journal	133
Information Systems Research	233
Journal of the Association for Information Systems	142
Journal of Information Technology	104
Journal of Management Information Systems	222
Journal of Strategic Information Systems	86
MIS Quarterly	307
Total	1,421

Table 2. Persuasive technology papers published in the eight IS journals in IS from 1990 to 2021

Persuasion –Related Area	Keywords	Number of Papers
Persuasion	Persuasion, attitude change, behavior change	220
Learning	Learn	596
Motivation	Motivation	334

Persuasion –Related Area	Keywords	Number of Papers
Nudge	Nudge	12
Social influence	Social influence	449

Note: Some papers explore multiple areas.

Table 3. Persuasive technology papers published in the eight IS journals in IS from 1990 to 2021 grouped by persuasion-related research area

2.4 Persuasion Awareness

The term "persuasion awareness" refers to individuals' beliefs regarding whether or not an entity is trying to influence them. Persuasion awareness is neutral. That is, the individuals can perceive that the persuasion attempts are trying to persuade and/or assist them. The former case shows that persuasion awareness is negative. The latter case suggests that persuasion awareness is not negative or positive. In the next section, I explain persuasion awareness in detail. As communication and marketing research has extensively explored this topic, I focus on the main theories used in explaining persuasion awareness discussed in these bodies of research.

According to my review, there are three theories which systematically explain persuasion awareness—*attribution theory* (Robertson and Rossiter 1974), *equity theory* (Campbell 1995), and *persuasion knowledge model* (PKM, Friestad and Wright 1994).

2.4.1 Attribution Theory

Building on attribution theory, Robertson and Rossiter (1974) demonstrate that there are two types of attributions of the persuasion attempt—perceived assistive intent and perceived persuasive intent. In their study, they focused on how children perceived TV commercial programs and examined the effect of developmental factors and cognitive factors on children's perceptions. They referred to "perceived assistive intent" as the perception that the program aims at helping the audience to understand products, and to "perceived persuasive intent" as the perception that the

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program tries to make you buy products. They found that perceived assistive intent of the program increased its positive impact on children's attitudes and behaviors, while perceived persuasive intent decreased its positive impact. They also noted that if individuals perceive both assistive and persuasive intent, perceived persuasive intent will have a more powerful effect than perceived assistive intent. In sum, this attribution research indicates that the individuals can perceive either assistive intent, persuasive intent, or both when interacting with the persuasion attempts.

2.4.2 Equity Theory

Campbell (1995) studied two advertising tactics, namely mystery ads and borrowed interest appeals, which acquire the consumers' interest to arouse them. Specifically, she examined the effect of such advertising tactics on consumers' "inferences of manipulative intent" of the advertiser. She defined manipulative intent as an attempt of the advertiser to persuade the consumer by inappropriate, unfair, or manipulative means. To explain this, she drew from equity theory, which suggests that "… perceptions of unfairness (inequity) are driven by a type of benefit/cost analysis involving a comparison of the self (e.g., the consumer) to another (e.g., the advertiser)" (Campbell 1995, p. 228). She proposed that the individuals balance between their perceived personal benefits (e.g., information, entertainment, and amusement) and perceived advertiser benefits (e.g., consumers' attention, product awareness, and sales) and between their perceived own costs (e.g., attention, effort required to process persuasion attempt, and involvement) and perceived advertiser costs (e.g., money, time, and effort). Also, she argued that if perceived personal benefits outweigh perceived advertiser benefits and perceived personal costs are less than perceived advertiser cost, less perceived manipulative intent will take place. Otherwise, consumers will perceive more manipulative intent. This study showed that perceived personal benefits and advertiser costs significantly decreased perceived manipulative intent, while

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perceived personal costs significantly increased perceived manipulative intent. However, a significant effect of perceived advertiser benefits on perceived manipulative intent was not found. This study also found that inferences of manipulative intent significantly influenced consumers' responses including attitude towards the ad and the brand, and purchase intention.

Overall, this study details the process of persuasion awareness which includes four important constructs 1) perceived benefits of individuals, 2) perceived benefits of advertisers or persuasion agents, 3) perceived costs of individuals, and 4) perceived costs of agents. The balance among these four components will affect the inferences of manipulative intent, which are the overall evaluation of persuasion awareness.

2.4.3 Persuasion Knowledge Model (PKM)

As another persuasion awareness theory, the Persuasion Knowledge Model (PKM), developed by Friestad and Wright (1994), is dominant and extensively used. PKM sheds light on how persuasion targets are aware of the persuasion attempt generated by a persuasion agent and respond to it. The "target" refers to "those people for whom a persuasion attempt is intended (e.g., consumers, voters)" (Friestad and Wright 1994, p. 2). The "agent" is "whomever a target identifies as being responsible for designing and constructing a persuasion attempt (e.g., the company responsible for an advertising campaign; an individual salesperson)" (Friestad and Wright 1994, p. 2). The "persuasion attempt" is defined as "a target's perception of an agent's strategic behavior in presenting information designed to influence someone's beliefs, attitudes, decisions, or actions" (Friestad and Wright 1994, p. 2). Examples of persuasion attempts are ads, sales presentations, and messages. A response to a persuasion attempt is called a "coping" behavior. The coping behavior

includes the targets' cognitive and physical actions in response to the persuasion attempt. The observable part of the persuasion attempt is called "persuasion episode."

Friestad and Wright (1994) coined the term "persuasion knowledge" which is one type of three knowledge structures individuals possess. Knowledge, in this case, refers to what the individuals believe, rather than objective facts. It can be developed over time through persuasion education (i.e., learning about persuasion strategies), persuasion engagement (i.e., direct experiences with persuasion attempts), or persuasion observation (i.e., observing others being persuaded). According to PKM, the three types of knowledge are 1) "persuasion knowledge" defined as individuals' beliefs regarding persuasion actions/tactics persuasion agents use and their own goals, 2) "agent knowledge" defined as individuals' beliefs regarding the persuasion agent's traits, competencies, goals, and 3) "topic knowledge" referring to individuals' beliefs concerning the topic of persuasion (e.g., products, political candidates).

According to PKM, when individuals are exposed to the persuasion attempt (e.g., an advertisement) created by a persuasion agent (e.g., a company), they do not always interpret the agent's action as a persuasion attempt. This interpretation depends on their three types of knowledge, specifically persuasion knowledge. The individuals' persuasion knowledge which involves lay theories about persuasion actions/tactics as well as their own goals has already been embedded in their minds. Also, PKM proposes that individuals with high agent and topic knowledge will be less likely to rely on their persuasion knowledge (e.g., Cowley and Barron 2008; Wei et al. 2008). However, persuasion knowledge requires access to it in order to make the individuals aware of the persuasion attempt. PKM assumes that individuals use their persuasion knowledge to evaluate the agent's overall persuasion competence which includes *perceived*

effectiveness and *perceived appropriateness* of persuasion tactics. Perceived effectiveness refers to "whether the marketer's actions seem likely to produce psychological effects that strongly affect buying decisions." Perceived appropriateness refers to "whether the marketer's tactics seem to be moral or normatively acceptable" (Friestad and Wright 1994, p. 10). These evaluations will influence the individuals' overall assessment of the persuasion action. If the individuals have positive evaluations of the persuasion action, they will respond to it in a positive way (e.g., acceptance).

PKM argues that when individuals are aware of the persuasion attempt, they will engage in coping behaviors ranging from acceptance to reactance. The underlying reason for coping behaviors is to achieve the individuals' own goals. If the individuals who are aware of the persuasion attempt perceive that this attempt can help them achieve their goals, they will be more likely to accept it. Otherwise, they will resist the persuasion attempt.

PKM reveals the process of persuasion awareness. Like Robertson and Rossiter (1974), PKM implies two forces of persuasion awareness—perceived assistive and persuasive intent. The two forces align with perceived personal and agent benefits proposed by Campbell (1995). PKM's perceived appropriateness of persuasion tactics, which is an overall evaluation of the agent's action, is in line with inferences of manipulation intent suggested by Campbell (1995). Accordingly, PKM implies that the two forces of persuasion awareness, perceived assistive and persuasive intent of the agent, will influence the perceived appropriateness of the agent action and coping behaviors. That is, perceived assistive intent will increase perceived appropriateness, and perceived persuasive intent will decrease perceived appropriateness. Perceived appropriateness will influence coping behaviors or behavioral responses.

Figure 2 depicts relationships among the constructs of the three theories—attribution theory, equity theory, and persuasion knowledge model.
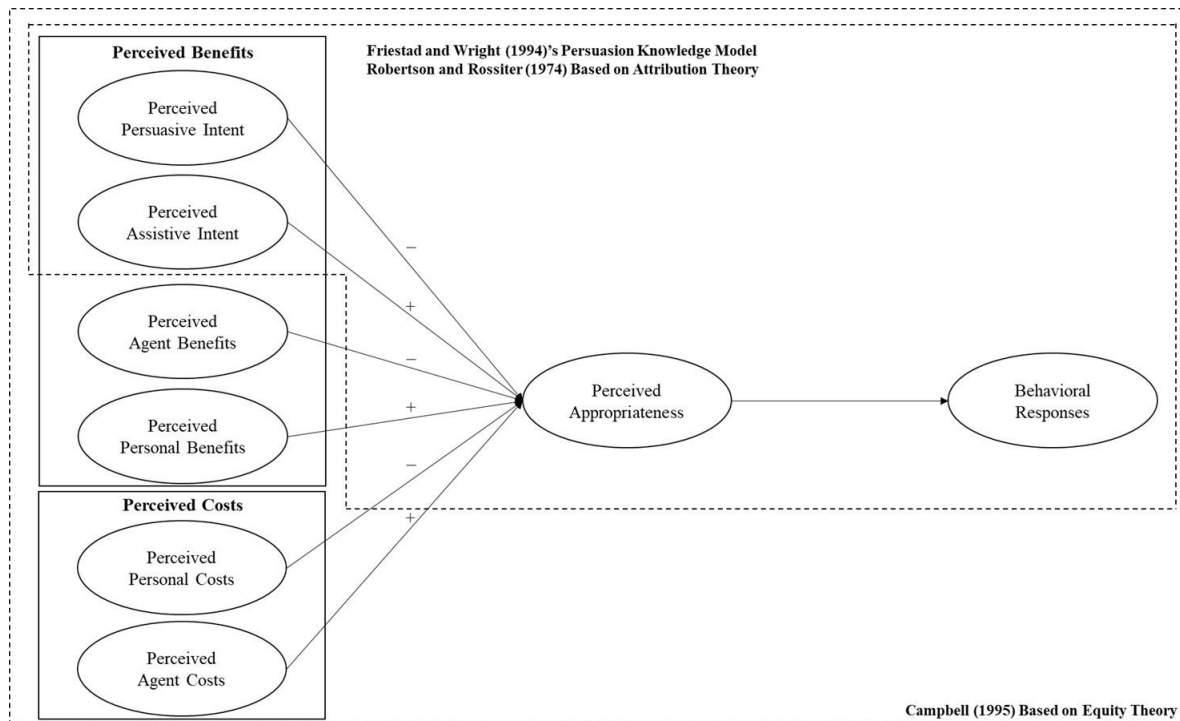
Figure 2. Persuasion awareness (adapted from PKM, Robertson and Rossiter (1974), and Campbell (1995)

2.4.4 Antecedents of Persuasion Awareness

According to PKM, individuals who encounter a persuasion action triggered by an agent do not always perceive such attempts as persuasion attempts. Their perception of the persuasion attempt is governed by their three types of knowledge (persuasion, agent, and topic knowledge), specifically persuasion knowledge. As persuasion knowledge requires activation to it such that the individuals perceive the persuasion attempt. One factor influencing access to persuasion knowledge is cognitive capacity. Prior literature found that individuals with high cognitive capacity were more likely to access their persuasion knowledge, thereby being aware of persuasion attempts (Campbell and Kirmani 2000; Williams et al. 2004). The individuals' knowledge and

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cognitive capacity affect their perception of persuasion attempts. This suggests that these two dimensions of the individuals' characteristics play a role in shaping persuasion awareness.

In addition to the individuals' characteristics (knowledge and cognitive capacity), factors associated with persuasion attempts influence the individuals' persuasion awareness. These factors are the explicitness and timing of persuasive attempts. "Explicitness of persuasion attempts" can deal with persuasion *content* (Jeong and Lee 2013; Martin and Strong 2016) and *format* (Cowley and Barron 2008; Tutaj and van Reijmersdal 2012) of persuasion attempts. As an example of the "content explicitness of persuasion attempts," Martin and Strong (2016) tested the effects of the comparative advertising content, specifically the conclusion of advertising messages, together with persuasion awareness, on brand attitudes, willingness to pay, and purchase intention. In their study, they manipulated the conclusion explicitness of advertising messages—implicit, open-ended (i.e., "Who's most likely to leave the other brand behind? Read the facts and you decide."), and explicit, closed-ended conclusions (i.e., "Who's most likely to leave Samsung behind? Nikon, of course.") (p. 477). They found that the advertising messages with implicit conclusions increased favorable behavioral responses of the persuasion-aware individuals more than those with explicit conclusions. Hence, the explicitness of persuasion messages has an impact on individuals' responses. For instance of "format explicitness of persuasion attempts," Cowley and Barron (2008) examined the effect of product placement in the television program. Specifically, they manipulated the prominence of the product placed in the program (prominent vs. subtle format). They found that the subtle product placement increased positive attributes toward the brand, compared with the prominence format. This indicates that the format of product information matters.

As an example of "timing of persuasion attempts," Campbell and Kirmani (2000) examined two factors influencing consumers' use of persuasion knowledge—the timing of flattery of a salesperson and cognitive resources. They found that when the individuals were exposed to the salesperson's flattery prior to purchase (vs. after purchase) and had high cognitive resources, they were more likely to use their persuasion knowledge and thus perceived the persuasion attempt which, in turn, led to perceived insincerity of the agent. This is explained by the accessibility of persuasion motives. That is, the salesperson's flattering before individuals purchased made the link between salesperson's flattering and sales more salient than the flattering after their purchase. This study shows that the timing of flattery, which is a persuasion attempt, has an impact on the individuals' attitudes toward the persuasion agent.

2.4.5 Consequences of Persuasion Awareness

Persuasion awareness literature proposes that when individuals are aware of persuasion attempts, they will engage in behaviors in response to such attempts (e.g., Campbell 1995; Friestad and Wright 1994; Moyer-Gusé et al. 2012). One behavioral response that deserves attention in persuasion awareness research is reactance. As Brehm and Brehm (1981) argue, when an individual feels that her freedom is threatened, she will respond to restore that freedom. They also point out that reactance will affect her subsequent attitudes and behaviors. That is, she will be more likely to move in the opposite direction from whatever limits her freedom (Clee and Wicklund 1980). This threat to freedom could result from a persuasion agent who is trying to constrain her behavior by promoting a specific product to her (Fitzsimons and Lehmann 2004). Also, persuasive messages that serve as a persuasion attempt were found to stimulate reactance and thus negative attitudes and behaviors (e.g., Dillard and Shen 2005; Miller et al. 2007). Persuasion awareness

research provides support to the relationship between persuasion awareness and negative attitudes and behaviors. For instance, Williams et al. (2004) show that when individuals exposed to a persuasion attempt in the form of the intention question were aware of the question's persuasive intent, they were less likely to perform the behavior in question. Thus, reactance is one possible outcome of persuasion awareness.

However, PKM asserts that behavioral responses to persuasion awareness are not limited to reactance. According to PKM, coping behavior, which is a neutral term, is used to reflect these responses. It refers to the fact that "resourceful participants who pursue their own goals and have the ability to select response tactics from their own repertoire, akin to the way agents select persuasion tactics" (Friestad and Wright 1994, p. 3). This implies that when individuals are aware of persuasion attempts, they will develop coping behaviors that align with their own goals. Friestad and Wright (1994) state simple ignorance and elaboration on persuasion attempts (i.e., message content) as examples. In the former instance, individuals who are aware of persuasion attempts would simply ignore them. In the latter example, persuasion-aware individuals might elaborate on persuasive message content and identify support and counterargument. Also, they predict that the individuals with greater coping expertise will engage in larger ranges of coping behaviors than the individuals with limited expertise. As a greater coping expertise behavior, individuals would separate their emotion and evaluation to persuasion strategies from their use of relevant information concerning the product or service (Friestad and Wright 1994). As an example of a limited coping expertise behavior, individuals might develop "rigid, absolute compartmentalization (e.g., "all TV ads are misleading," "All Nike ads are trustworthy")" (Friestad and Wright 1994, p. 12). As PKM notes, adults will follow greater expertise coping behaviors, as they acquire more experiences of coping. However, to the best of my knowledge,

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simple ignorance and elaboration have received little attention in persuasion awareness research than reactance. In sum, persuasion awareness consequences can be positive, negative, or neutral.

2.4.6   Means to Enhance Persuasion Awareness

As PKM posits, educating the individuals about persuasion, such as providing information regarding persuasion tactics, will trigger their persuasion knowledge and thus enhance persuasion awareness. This is known as the "change of meaning" principle, which makes individuals more vigilant to their persuasion knowledge. Without the activation of their persuasion knowledge, individuals are less likely to perceive the agent's action as a persuasion attempt. Prior research has explored this notion. For instance, Williams et al. (2004) investigated how the intention question (e.g., How likely are you to eat fatty foods in the next week?) influenced the consumers' behavior. They found that this type of question effectively persuaded the individuals to engage in targeted behaviors (e.g., eating less unhealthy food) as long as their persuasion knowledge was not activated. When the consumers' persuasion knowledge was triggered, they were less likely to engage in the targeted behavior. In their study, they offered individuals information with respect to the persuasion agent and information regarding the effect of intention questions. They found that the two manipulations triggered the individuals' persuasion knowledge and thus perceived persuasive intent. This study indicates that consumers might resist the persuasion attempt when their persuasion knowledge is activated through the presence of information regarding persuasion or agents. As a result, the principle which enhances the individuals' persuasion awareness is to provide information with respect to persuasion actions or tactics and persuasion agent, known as *persuasion information* and *agent information*, respectively.

To implement this principle, prior research manipulates the "timing" of providing information which includes *prior*, *concurrent*, or *after* exposure to a persuasion attempt. Campbell (1995) suggests that the timing of providing information (e.g., agent information) will influence persuasion awareness. In particular, late information will dampen persuasion awareness more than early information. The underlying mechanism is that late information will increase the individuals' attention to process a persuasion attempt (e.g., mystery ads which create suspense and reveal the sponsoring brand lately), compared with early information. Research on PKM supports the notion of information timing. Like forewarning messages, persuasion information is often given prior to the individuals' exposure to persuasion attempts (e.g., Williams et al. 2004). Agent information is provided concurrently (e.g., Kirmani and Zhu (2007)) or after their exposure to persuasion attempts (e.g., Campbell 1995). Consequently, there are three applicable stages of timing at which persuasion and agent information can be provided—prior, concurrent, or after the individuals' exposure to the persuasion attempt.

Appendix A Table 76 represents examples of persuasion awareness research. Table 4 summarizes the factors influencing persuasion awareness. The factors are grouped into the individual characteristics, the persuasion attempt characteristics, and the means to enhance persuasion awareness.

Antecedents/Moderators	References
1) Individuals' characteristics	
1.1) Individuals' knowledge	
1.1.1) Persuasion knowledge	Robertson and Rossiter (1974)
	Hibbert et al. (2007)
1.1.2) Agent knowledge	Robertson and Rossiter (1974)

Antecedents/Moderators	References
	Hibbert et al. (2007)
	Wei et al. (2008)
1.1.3) Topic knowledge	Robertson and Rossiter (1974)
1.2) Cognitive capacity	Campbell and Kirmani (2000)
	Williams et al. (2004)
1.3) Other characteristics (e.g., age, education, income, regulatory focus)	Robertson and Rossiter (1974)
	Kirmani and Zhu (2007)
	Jeong and Lee (2013)
2) Characteristics of persuasion attempts	
2.1) Explicitness of persuasion attempts	
2.1.1) Content explicitness	Campbell (1995)
	Kirmani and Zhu (2007)
	Jeong and Lee (2013)
	Martin and Strong (2016)
2.1.2) Format explicitness	Cowley and Barron (2008)
	Tutaj and van Reijmersdal (2012)
2.2) Timing of persuasion attempts	Campbell and Kirmani (2000)
3) Means to Enhance Persuasion Awareness	
3.1) Persuasion information	Campbell and Kirmani (2000)
	Williams et al. (2004)
	Kirmani and Zhu (2007)
	Cowley and Barron (2008)
3.2) Agent information	Williams et al. (2004)
	Kirmani and Zhu (2007)
	Wei et al. (2008)
3.3) Timing of information	
3.3.1) Timing of persuasion information	Campbell and Kirmani (2000)
	Williams et al. (2004)
	Kirmani and Zhu (2007)

Antecedents/Moderators	References
	Cowley and Barron (2008)
3.3.2) Timing of agent information	Campbell (1995)
	Williams et al. (2004)
	Wei et al. (2008)

Table 4. Summary of factors influencing persuasion awareness

Based on the literature review, Table 5 summarizes the key constructs of persuasion awareness and their definitions.

Construct in My Thesis	Attribution Theory (Robertson and Rossiter 1974)	Equity Theory Campbell (1995)	Persuasion Knowledge Model (PKM, Friestad and Wright 1994)
Perceived assistance (perceived assistive intent of an agent and perceived user benefits)	Perceived assistive intent – a perception that a persuasion action (e.g., TV program) aims at enlightening an individual (e.g., product information)	Perceived personal benefits – benefits an individual acquires after involving with a persuasion action (e.g., information, entertainment, and amusement)	Perceived assistive intent – a perception that an agent tries to serve an individual's own goals
Perceived persuasion (perceived persuasive intent of an agent and perceived agent benefits)	Perceived persuasive intent – a perception that a persuasion action tries to influence you to buy products	Perceived agent benefits – benefits an agent receives after delivering a persuasion action (e.g., persuasion targets' attention, increased product awareness, and sales)	Perceived persuasive intent – a perception that an agent tries to serve its own goals

Construct in My Thesis	Attribution Theory (Robertson and Rossiter 1974)	Equity Theory Campbell (1995)	Persuasion Knowledge Model (PKM, Friestad and Wright 1994)
Perceived user costs	N/A	Perceived personal costs – costs an individual spends in consuming a persuasion action (e.g., attention, effort required to process persuasion attempt, and involvement)	N/A
Perceived agent costs	N/A	Perceived agent costs – costs an agent spends in delivering a persuasion action (e.g., money, time, and effort)	N/A
Perceived appropriateness of an online entity that provides persuasive design features (PDF)	N/A	Perceived manipulative intent – a perception that an agent tries to persuade an individual by inappropriate, unfair, or manipulative means	Perceived appropriateness – a perception that the agent's action is moral or acceptable

Table 5. Persuasion awareness constructs and their definitions from existing literature

The above section specifies the process of persuasion awareness based on the three theories, the antecedents of persuasion awareness which involve the individuals' characteristics and the

persuasion attempts' characteristics, as well as a means to enhance the individuals' persuasion awareness. In general, the three theories—attribution theory, equity theory, and PKM—suggests that individuals can interpret persuasion actions as persuasive or assistive. In the next section, I review persuasion awareness in the domain of IS.

2.5   Persuasion Awareness in IS

Although considerable research has explored the role of IT in persuading users to shape targeted attitudes or to perform targeted behaviors, little attention has been paid to the effect of IT design on users' persuasion awareness. I review persuasion awareness research published in the basket of eight journals. I searched the following keywords—persuasion awareness, persuasion detection, persuasive intent, and persuasion attempt—in the Web of Science database. There is none which clarifies how and why IT design influences users' perception of being persuaded. However, there are a small number of IS studies published in Information Systems Research and other outlets which offer partial insight into persuasion awareness.

Yi et al. (2019) investigated how highlighting a consumer review by a company influenced users' intention to consume products. They found that highlighting a positive review attracted users. However, it did not always increase consumption intention, especially in the context of mixed reviews and for a company with a strong reputation. That is, highlighting a positive but less extreme review increased users' intention more than highlighting an extremely positive review. They reasoned that skepticism, defined as "their [users] disbelief in the message claims [highlighted reviews] or mistrust in the marketers' motives," explained the impact of a highlighted review on users' intention (Yi et al. 2019, p. 712). In other words, highlighting a review made it more explicit and thus activated users' perceived persuasive intent. It appears that this skepticism

construct aligns with perceived persuasive intent in this thesis. Although it explained the effect of a highlighted review, the authors did not measure it directly or evaluate how a highlighted review will influence it and how it will affect users' intention. Also, persuasion awareness studied in this thesis captures a broader concept and details how it is triggered and works.

Pöyry et al. (2017) examined the effects of personalized product recommendations on click-through rate. They found that the form of recommendation message (active or passive recommendation), the base of personalization (recommendation based on past behaviors, present behaviors, or random), and the page on which the recommendation was given (front, category, product, or purchase page) influenced the number of clicks on a product recommended. They explained that these effects resulted from the perceived intrusiveness of personalized recommendations, which occurred when an individual perceived that the recommendations interrupted her goal. They expected that perceived intrusiveness would trigger reactance or avoidance of recommendations. Results of their study suggested that the recommendations based on the customers' current browsing behaviors and in the passive form (e.g., "others who viewed this, viewed also") showed the lowest perceived intrusiveness, whereas the recommendations based on past browsing behaviors and in the active form (e.g., "we recommend for you") had the highest perceived intrusiveness. This perceived intrusiveness implies that the goal of recommendations is not consistent with the individuals' goal. The goal of the individuals partly reflects persuasion knowledge in PKM. As persuasion knowledge is required to trigger persuasion awareness, perceived intrusiveness might partially explain persuasion awareness. However, unlike perceived intrusiveness which reflects a negative side, persuasion awareness can be perceived either good, bad, or both. For example, when Facebook presents a product ad, a user would be aware that Facebook aims to generate revenue from ads, but at the same time, she might find it

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interesting. In this way, she would perceive that this ad is not bad and click it. Therefore, I propose that persuasion awareness is a broader concept than perceived intrusiveness.

For another example, Müller et al. (2018) study the relationships between users' perceptions about social influencer marketing and their purchase intention. Social influencer marketing refers to the endorsement of products of companies by influencers who have a large number of followers in their social network. An example of social influencer marketing is the product-related post of an Instagram influencer who owns sizable followers. In their study, they identify three types of perceptions about this influencer marketing—perceptions about an ad, perceptions about an influencer (persuasion agent), and perceptions about a product. They hypothesize that these three perceptions are associated with the individuals' intention to purchase the product. Of particular interest to my research is advertising disclosure, defined as "customers' perception of being confronted with an online ad," which is part of perceptions about the ad (Müller et al. 2018, p. 3). They reason that advertising disclosure helps the individuals realize the persuasion attempt of the product endorsement and thus influences purchase intention. However, this study focuses on one manifestation of persuasion practices, the post of a social influencer (ad), and does not clearly explain how and why the influencer's post affects the individuals' perception that the post tries to persuade them.

Although persuasion detection is not studied in the basket of eight journals, deception detection in online product recommendation agents was studied by Xiao and Benbasat (2015). Specifically, they designed warning messages for detecting biased recommendations. Although persuasion does not include deception, their study can shed some light on how to create persuasion detection mechanisms, transparency mechanisms. In their study, they developed warning messages in terms

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of advice availability (i.e., how to check biased recommendations) and framing (i.e., positive-frame: increased chance, negative-frame: reduced chance). They found that warning messages without advice were a double-edged sword. That is, waning messages enhanced correct detection at the expense of increased false detection. On the other hand, warning messages with advice led to higher correct detection and did not increase false detection, specifically for the negative-framed messages. This study shows that information featured in warning messages can influence users' detection performance. This finding is consistent with the "change of meaning" method (i.e., providing information about persuasion tactics) in PKM literature.

In sum, IS research has examined the role of system characteristics in enabling persuasion. However, IS research does not provide a full insight into users' persuasion awareness. As a result, I aim to develop a comprehensive understanding of this domain. To do so, I first define constructs of persuasion awareness based on Persuasion Knowledge Model (PKM) and identify the technological antecedents of persuasion awareness in online settings based on the literature on Decision Support Systems (DSS). In the next chapter, I outline the theoretical foundations of persuasion awareness in online settings and persuasive design features (PDFs) which serve as technological determinants of persuasion awareness.

Chapter 3: A Theoretical Model of Persuasion Awareness in Online Settings

3.1   Overview

The main objective of this chapter is to develop an integrated theoretical model of persuasion awareness in online settings and propose hypotheses. In chapter 2, I review the relevant research to understand the domain of study. Based on this review, I define the term "persuasion awareness" as users' beliefs regarding whether or not an entity is trying to influence them. Drawing on the Decision Support Systems literature (DSS, Silver 1990, 1991, 2006), I identify two *forms* of persuasive design feature (PDF) in online settings, *suggestive* and *supportive*. The form refers to what persuasive design feature (PDF) is offered to users. The suggestive form emphasizes the degree to which an online entity provides an explicit direction on what to do to users, while the supportive form focuses on a function that an entity offers to support users. Extending the suggestive form, I detail its four content elements based on Toulmin's model of argumentation (Toulmin 2003): 1) *claim*—a conclusion or recommendation PDF asserts, 2) *data*—facts grounding for the claim, 3) *backing*—supporting information for the justification from data to the claim, and 4) *warrant*—a justification for moving from the factual data to the claim. Also, I specify two additional dimensions of the suggestive PDF: *mode*—how PDF is constructed (whether it is built based on users' preferences), and *invocation style*—how PDF is triggered. Taken these dimensions of PDF together with Persuasion Knowledge Model (PKM, Friestad and Wright 1994), I explain how and why these dimensions will influence users' interpretation of persuasion awareness and thus their behavioral responses (i.e., acceptance or reactance). Also, I propose applicable transparency mechanisms that foster users' persuasion awareness and informed decisions in online settings. As a result, this research model serves as an initial step to

understanding this domain systematically and informing designers to develop technologies that increase user awareness of persuasion attempts triggered by PDFs, as well as user awareness of PDFs and their responses to them.

3.2   Theoretical Framework

3.2.1   A Theory of Persuasion Awareness in Online Settings

In this chapter, I introduce a theory of persuasion awareness in online settings and define relevant constructs. To explain persuasion awareness in online environments, I employ Persuasion Knowledge Model (PKM, Friestad and Wright 1994) as a main theoretical framework and also combine it with Attribution Theory (Robertson and Rossiter 1974) and Equity Theory (Campbell 1995). Utilizing Attribution Theory, Robertson and Rossiter (1974) propose that perceived assistive and persuasive intent of the persuasion agent have a positive and a negative impact on the individuals' behavioral responses to the agent, respectively. Using Equity Theory, Campbell (1995) found that the balance between the individual benefits/costs and the agent benefits/costs affect the individual's perceived manipulative intent or appropriateness of an agent. As a dominant theory of persuasion awareness, Persuasion Knowledge Model (PKM) developed by Friestad and Wright (1994) posit that an individual uses her own persuasion knowledge to detect a persuasion attempt. As PKM notes, the individual who interprets such persuasion attempt will cope with the attempt in the way that benefits the individual's goal.   In other words, the individual who encounters the persuasion attempt will perceive that such attempt tries to serve her own goal, which I refer to perceived assistive intent, or does not do so, which I call perceived persuasive intent. The individual will evaluate such attempt in terms of its appropriateness and effectiveness. In this manner, persuasion awareness can be perceived as either good or bad, or both simultaneously.

Accordingly, I define "persuasion awareness" as users' perception that an online entity attempts to influence them.

PKM is a dominant framework in persuasion awareness research and shares underlying concepts with those of Robertson and Rossiter (1974) and Campbell (1995). As described earlier, when the individuals are exposed to a persuasion attempt, they can develop two perceptions regarding such attempt—perceived assistive intent and perceived persuasive intent. This is consistent with Robertson and Rossiter (1974). Campbell (1995)'s personal benefits and the agent benefits align with perceived assistive and persuasive intent, respectively. Despite their correlation, they are distinct concepts. When an individual feels that an agent is trying to help her, she might not perceive that the agent's action benefits her. The former focuses on the process, while the latter highlights the outcome of such process. Analogously, if she thinks the agent is attempting to persuade her, this does not mean that the agent will obtain benefits. Perceived persuasive intent captures the process, whereas perceived agent benefits are the outcome of persuasion. As a result, I conceptualize the two persuasion awareness constructs as higher-order reflective constructs: *perceived assistance beliefs* and *perceived persuasion beliefs*. I define "perceived assistance beliefs" as users' perception that an online entity is assisting them in fulfilling their own goals. The perceived assistance beliefs higher-order construct underlies: 1) perceived assistive intent referring to users' perception that an online entity tries to help them and 2) perceived user benefits reflecting users' perceptions that they benefit from interacting with an online entity. The "perceived persuasion beliefs" construct is defined as users' perception that an online entity persuades them to fulfill its goal. It underlies 1) "perceived persuasive intent" that is users' perception that an online entity tries to persuade them and 2) "perceived agent benefits" which is users' perception that an online entity benefits from them.

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Note that perceived assistance is similar to perceived usefulness in Technology Acceptance Model (TAM, Davis 1989). Davis (1989) defined perceived usefulness as "the degree to which a person believes that using a particular system would enhance his or her job performance" (p. 320). However, perceived assistance is different from perceived usefulness. It encompasses both perceived assistive intent and perceived user benefits. Perceived assistive intent emphasizes users' perceptions regarding "why" an online entity is designed in such a way that helps them with the task at hand. In contrast, perceived usefulness focuses more on users' perception concerning the outcome of entity use. If a user perceives that an online entity designs a PDF to help her, this does not guarantee that she will find it useful when interacting with it. As perceived user benefits center around users' benefits from interacting with an online entity (e.g., information), it is similar to perceived usefulness. Nevertheless, perceived usefulness focuses more on the outcome in enhancing users' task performance (e.g., do a task more quickly). As a result, despite their similarity, the perceived assistance is larger than and differs from perceived usefulness.

Campbell (1995) found that when the individuals' benefits outweighed the agents' benefits, the individuals perceived less manipulative intent of the agents. The perception of manipulative intent is in line with PKM's perceived appropriateness of the agent's tactics. "Perceived appropriateness of the persuasion action" refers to individuals' perception that the persuasion attempt is moral or normatively acceptable. Following this, perceived assistance and perceived persuasion will have positive and negative effects on perceived appropriateness, respectively. In other words, a persuasion attempt can be perceived as more, less, or equally assistive or persuasive, thereby influencing individuals' perceived appropriateness and thus attitudes and behaviors. Consequently, I adopt PKM as a main theoretical foundation to specify the primary constructs in my theoretical model.

In addition, taking PKM together with Campbell (1995), perceived personal and agent costs will also influence perceived appropriateness. According to Campbell (1995), the term "perceived personal costs" refers to an individual's perception of how much attention, effort, or involvement she spends to process a persuasion action, whereas the term "perceived agent costs" reflects an individual's perception that how much money, time, or effort an agent spends to trigger a persuasion action. When an individual feels that she spends her attention or effort more in processing an agent's action, she will be more likely to perceive that this interaction is unfair and inappropriate. On the other hand, if she perceives that an agent puts more time or effort in delivering a persuasion action, she will feel higher appropriateness of such action. Thus, while perceived personal cost has a negative impact on perceived appropriateness, perceived agent cost has a positive impact on perceived appropriateness.

Moreover, PKM suggests the way which enhances the individuals' perception of persuasive intent of the agent, called the change of meaning principle. Extant research has employed this method by providing information regarding persuasion tactics (e.g., Campbell and Kirmani 2000) and persuasion agents (e.g., Williams et al. 2004). This stream of research also manipulated the timing of providing such information. Specifically, information can be given prior, concurrent, or after persuasion attempts (e.g., Kirmani and Zhu 2007). This suggests that the type of information and the timing of information will impact the individuals' persuasion awareness. Thus, PKM is a promising theory that outlines possible transparency mechanisms in my study.

In my study's context, online entities, including e-commerce websites, social networking sites, online applications, serve as persuasion agents, and online users are the target of persuasion. The interface design of online entities is hypothesized to trigger users' perceived persuasion, perceived

assistance, perceived user costs, and perceived agent costs. In the next section, I propose the key features of persuasive design which serve as technological determinants of persuasion awareness in online settings.

3.2.2 A Typology of Persuasive Design Features in Online Settings

3.2.2.1 Decision Support Systems as a Basis for Persuasive Design Features (PDFs)

To identify the key features of persuasive design, the term "persuasive design" and "persuasive design feature" are defined. Following PKM and the definition of Oinas-Kukkonen and Harjumaa (2008)'s persuasive system, I refer persuasive design to a deliberate attempt performed by an online entity aiming at influencing user's attitudes and/or behaviors without using *coercion* or *deception*. As design features have several meanings in different disciplines (e.g., design science, human-computer interaction), I found the definition of a design feature from the Decision Support System (DSS) literature helpful. Silver (2008) defined design features of DSS as "all of a decision support system's components, characteristics, and properties, including, but not limited to, its information-processing functions and elements of its user interface" (p. 262). This is consistent with the definition of Fogg (2003)'s persuasive technology tool which refers to "an interactive product designed to change attitudes or behaviors or both by making a desired outcome easier to achieve" (p. 32). Taken the above three definitions, I define a "persuasive design feature" (PDF) as a component of an online entity that influences and facilitates users to perform a targeted outcome.

Decision Support System (DSS) is one stream of IS research which explains how IT can be designed to facilitate users' decision making and thus can provide useful insights for specifying features of persuasive design. According to Silver (1990, 1991), DSS can serve as a change agent

by providing system restrictiveness and decisional guidance to users. He defined system restrictiveness as "the degree to which and the manner in which a Decision Support System limits its users' decision-making processes to a subset of all possible processes" (p. 52) and decisional guidance as "the degree to which and the manner in which a Decision Support System guides its users in constructing and executing decision-making processes, by assisting them in choosing and using its operators" (p. 57). Despite its influence on decisions, system restrictiveness could induce users' negative attitudes and behaviors (e.g., Wang and Benbasat 2009). Decisional guidance was shown to improve users' decisions and attitudes toward a system (e.g., Parikh et al. 2001). The nature of decisional guidance fits my study's context which focuses on how the design of an online platform influences users' judgments and decisions without using coercion or deception. As a result, I exclude the system restrictiveness dimension and focus more on decisional guidance in this thesis.

3.2.2.1.1 Decisional Guidance as a Basis for PDF Forms

Silver (1990) classified decisional guidance on several dimensions. Of particular interest to persuasive design is the motive of a system designer and the form of decisional guidance. The motive focuses on why DSS provides decisional guidance to users. There are two motives of the system designer: a support motive and an influence motive. The support motive is to support users to perform their tasks without giving a direction of influence. In contrast, the influence motive is to influence users' decision strategies. Although the support motive does not suggest a direction, a designer of DSS expects that users' interactions with the system over time lead to some forms of change. To do so, DSS offers decisional guidance aiming at facilitating users' decision-making

tasks. The influence motive is to influence users in a given direction. In this case, DSS provides decisional guidance to steer users toward a targeted behavior.

In addition to designers' motives, guidance can also be classified in terms of forms. A form indicates what decisional guidance is given to users. One form is *suggestive guidance* that gives specific recommendations to users. Another form is *informative guidance* that presents relevant information to inform users without recommending what to do. In this manner, it appears that suggestive guidance focuses on the decision-making outcome, while informative guidance emphasizes the decision-making process. Silver (1990) argues that both suggestive and informative guidance can be used in supporting (support influence) and influencing users' decision-making (influence support). Extant research supports the effect of forms of guidance on users' decisions. For instance, Parikh et al. (2001) examined the effectiveness of decisional guidance. In their study, informative guidance provided users with pertinent information about the forecasting task, and suggestive guidance gave suggestions regarding how to avoid possible mistakes in the forecasting task to users. They found that both types of decision guidance improved users' decision quality, satisfaction with the system, learning, and decision efficiency. As another example, Jiang and Klein (2000) studied the impact of decisional guidance on users' selection of decision-making strategies and decisions. Results showed that guidance affected how users chose decision strategies for the forecasting model. Also, Parkes (2013) explored the persuasiveness of DSS messages. He found that the type of decisional guidance led to users' perceived persuasiveness of DSS which was measured by reliance on DSS. In sum, these studies suggest that decisional guidance, the design features in terms of suggestion or information which influence the individuals' decisions, serves as a persuasion agent.

Nonetheless, Silver (2006) points out that it is unclear to differentiate between two forms of decisional guidance, as both can be designed as suggestive or informative. To resolve this, he revised this form dimension to the directivity dimension (Silver 2006). Directivity refers to the degree to which guidance explicitly steers users toward a specific direction. This revision results in three forms of guidance based on directivity—suggestive, quasi-suggestive, and informative guidance. Suggestive guidance is defined as "deliberate decisional guidance that makes explicit recommendations to the user on how to exercise his or her discretion" (Silver 2006, p. 109). Quasi-suggestive guidance is "deliberate decisional guidance that does not explicitly make a recommendation but from which one can directly infer a recommendation or direction" (Silver 2006, p. 109). Informative guidance refers to "deliberate decisional guidance that provides pertinent information that enlightens the user's choice without suggesting or implying how to act" (Silver 2006, p. 109). The revised three forms are applicable to resolve the operationalization concern. In this case, suggestive and quasi-suggestive guidance are two forms which can enable persuasion, while informative guidance is less likely to do so. As a result, I focus on these two forms, suggestive and quasi-suggestive features.

Moreover, an information-processing function is another form which can shape users' persuasion awareness. As Silver (2008) notes, the information-processing function is one of the design features. Todd and Benbasat (1991) found that users chose to enhance their decision strategy to be closer to a normative one in accordance with information-processing functions a system offered (i.e., sort – "sort columns in ascending or descending order according to a specified attribute key or multiple keys," conditional drop – "drop columns contingent upon the value of an attribute"). This study suggests that the function facilitating information-processing can influence users' decision-making. In this manner, the information-processing function serves as a facilitator and

allows users to make their own decisions without giving a specific direction. That is, technology increases users' capability to perform behaviors (Fogg 2003). This is consistent with supporting-service functionality (SSF) research, which provides a theoretical explanation of how perceived SSF influenced users' attitudes and behaviors. Cenfetelli et al. (2008) defined SSF as "the extent to which a website uses IT to provide services that support a core product or service transaction, and to help customers reach their shopping goals" (p. 162). They found that SSF had positive effects on users' perceived service quality, perceived website usefulness, and satisfaction with the website, thus affecting users' continued use of the website. Accordingly, I refer an information-processing function or supporting-decision functionality to *supportive guidance*. As PKM research shows, cognitive capacity plays a role in persuasion awareness. Specifically, individuals with high cognitive capacity are more likely to detect persuasion attempts than those with low cognitive capacity (Campbell and Kirmani 2000; Williams et al. 2004). Thus, supportive guidance, which makes users spend less of their cognitive capacity in decision-making tasks, influences their persuasion awareness. That is, the more supportive guidance is given, the more likely individuals will have the cognitive capacity needed to be aware of persuasion attempts.

In my research, the classification of PDF is based on the form which focuses on *what* design feature is given to users. I combine the two *forms* of decision guidance (suggestive and quasi-suggestive) and the information-processing function (e.g., sort) to identify key characteristics of PDF in online settings. However, unlike Silver (2006), I conceptualize the suggestive and the quasi-suggestive form as a continuum ranging from not suggestive, to quasi-suggestive, to suggestive, as depicted in Figure 3. This suggestive dimension will enable persuasion and users' perception of persuasion awareness. In other words, I expect that a high suggestive feature will increase persuasion awareness. As I focus on persuasion, the main motive of PDF is to influence online users in a

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specific direction (i.e., buying a particular product, liking a specific politician). The information-processing function or supportive form can influence users' cognitive capacity and hence users' persuasion awareness. Accordingly, there are two forms of PDF—a suggestive and a supportive form.
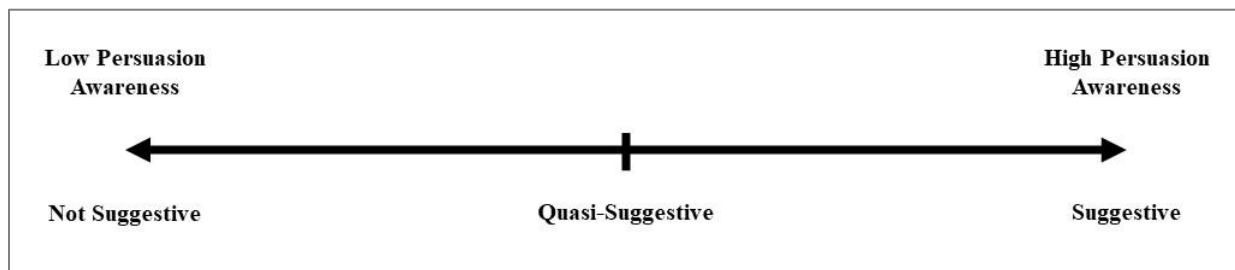
Figure 3. Suggestive form continuum

A *Suggestive* PDF offers an explicit direction regarding what to do to users. In Silver (1991), recommended operators or values used for decision-making tasks (e.g., forecasting) are examples of suggestive guidance. In online settings, recommendation systems (e.g., algorithm-based recommendations) fall in this category. For instance, Netflix gives movies recommended for its users (i.e., top picks for [username]).

A *Quasi-suggestive* PDF provides information from which users can infer a direction regarding what to do. This PDF does not explicitly recommend what to do to users. However, with information this PDF provides, users can infer a direction. This aligns with Martin and Strong (2016)' conclusion of advertising messages, together with persuasion awareness. When conclusion was excluded, individuals implied the direction of messages by themselves. In this case, it is in line with a quasi-suggestive PDF. According to Silver (1991), informative guidance provides information relevant to users' decision tasks *without* suggestions. It can provide a description of operators, tables, graphs, records of user behavior in similar contexts, and a history of user activity in this session (Silver 1991). Some pieces of information implicitly suggest specific directions to

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users, such as a record of user behaviors in similar contexts and a history of user activities in a session. Thus, information ranges from non-directive to directive information. While non-directive information fits the revised informative guidance, directive information aligns with the revised quasi-suggestive guidance. In the online context, Expedia.com provides information regarding "the number of others viewing this property right now." Another example is information regarding your Facebook friends like a specific page (i.e., [name], [name], and 34 other friends like this). Amazon.com tags the "low in stock" cue. The three examples provide information which can guide users to book a specific hotel, like a particular page, or purchase a particular product, without giving explicit directions regarding what to do. Thus, those information cues exemplify the quasi-suggestive PDF.

While both suggestive and quasi-suggestive PDF convey directions of influence, a supportive PDF does not. Nevertheless, a supportive PDF affects users' cognitive capacity, which contributes to their persuasion awareness. A *Supportive* PDF provides functionality in facilitating users to make decisions. Though it does not give suggestions or relevant information to users, it makes users process information and make decisions easier. Todd and Benbasat (1991) employed several information-processing functions, such as a conditional drop and a sort. They found that decreasing users' cognitive effort made them apply decision strategies that were too difficult to use otherwise. In e-commerce settings, Bestbuy.com allows consumers to drop product choices which do not meet their specified criteria through a filter and to order product alternatives based on their specified attribute through sort (i.e., price low to high, brand A – Z). This filter function resembles a condition drop function and thus serves as an information-processing function. Table 6 presents the two forms of PDF in online settings, their manifestations in the online context, and their references to DSS literature.

Form of PDF	Manifestations of PDF Form	DSS Literature	Examples in DSS	Reference(s)
Suggestive Form				
- Suggestive PDF	- Product recommended for you	Suggestive guidance	- Recommended operator or values	Silver (1991)
- Quasi-suggestive PDF	- 81 others viewing this product right now - 34 bought this product in the last 24 hours - Low in stock - Best-seller product	Quasi-suggestive guidance	- Record of behavior in similar contexts - History of activity in this session	Silver (1991, 2006)
Supportive Form				
Supportive PDF	- Filter - Sort - Virtual assistant	Information-processing function	- Conditional Drop - Sort	Todd and Benbasat (1991)

Table 6. Examples of PDF forms

Similar to persuasive messages a human agent provides to influence her audience, PDF can be used to influence users' judgments and behaviors. However, unlike persuasive messages, an online entity can offer supporting-decision functionality applicable in supporting users' decision tasks and affecting their persuasion awareness. Also, with technologies such as AI, the online entity has better knowledge about its users which helps it personalize the right PDF to influence them more effectively than persuasive messages. The suggestive form of PDF is applicable not only in

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persuading users, but also in influencing their persuasion awareness. Therefore, I expect that the two forms of PDF will affect persuasion awareness differently. For example, according to prior PKM literature, cognitive capacity is associated with perceived persuasive intent of an agent (Campbell and Kirmani 2000). Following this, a suggestive and a supportive form which facilitate users' decision-making process differently will require different degrees of cognitive effort. This leads to varying levels of persuasion awareness. For instance, a suggestive PDF which provides recommendations to users will require less processing effort, which, in turn, will increase their persuasion awareness. As another example, a supportive PDF, which does not state a direction, will moderate the impact of the suggestive or quasi-suggestive PDF on users' persuasion awareness, as it decreases their cognitive effort required in evaluating information and making decisions.

Although the form is an important characteristic of PDF, the operationalization of the suggestive form requires more details regarding how it is constructed (mode), how it is triggered (invocation style), and what content it features (content). Unlike the suggestive form, the supportive form provides a supporting-decision function (e.g., filter, sort) which does not involve details of content. Thus, the supportive form does not include the three additional dimensions. In sum, extending the suggestive form of PDF, I include three additional sub-dimensions which details 1) how it is constructed, called a *mode*, 2) how it is rendered, namely an *invocation style*, and 3) the specific content element(s), called *content*, in which the suggestive form is carried out in online settings. This results in three sub-dimensions of the suggestive form—mode, invocation style, and content.

Adopting DSS literature, I define the mode and the invocation style of the suggestive form in 3.2.2.1.2. To specify the content of the suggestive form, I employ Toulmin's model of argument, described in 3.2.2.2.

3.2.2.1.2 Mode and Invocation Style Dimension of Suggestive Form

According to Silver (2006)' revised classification of deliberate decisional guidance, there are two additional dimensions which are related to the suggestive and quasi-suggestive PDF—mode and invocation style. The timing dimension is excluded from my study. As a PDF delivered at a time of choice (concurrent timing) is posited to be the most effective on users' decisions (Fogg 2003), the suggestive and quasi-suggestive PDF are provided at the time of decision tasks.

Mode refers to "from where does the substance of guidance come?" (Silver 2006, p. 94). There are three modes of guidance: 1) predefined—a particular suggestion or information is predefined by a system designer, 2) dynamic—a suggestion or information provided based on learning dynamically, and 3) participative—a suggestion or information derived based on users' active participation. This mode can be applied to the suggestive and quasi-suggestive PDF. Accordingly, I define the mode as how the suggestive and quasi-suggestive PDF content is constructed. In my thesis, I focus on two modes: 1) *non-personalized*—the suggestive PDF content that is predefined by an online entity and 2) *personalized*—the suggestive PDF content that is generated by learning users' preferences. As prior research found, personalization had positive effects on users' trust and behaviors (Komiak and Benbasat 2006), the mode will moderate the impact of the suggestive form on users' persuasion awareness, with a personalized mode increasing perceived assistance beliefs.

Invocation style is defined as how guidance is triggered. DSS research has discussed three invocation styles: 1) automatic—a guidance that is provided automatically, 2) on-demand—a

guidance which is triggered upon users' request, and 3) hybrid—combining automatic and on-demand invocation (Silver 2006). In my thesis, I define the invocation style as how the suggestive form is triggered. As the suggestive form in my research provides content all at once, I focus on the *automatic* style, which PDF is always offered, and the *on-demand* style, on which PDF is triggered upon users' requests. Silver (2006) argues that automatic guidance would irritate users more than it helps. In a similar vein, I expect that the invocation style will moderate the effect of the suggestive and quasi-suggestive PDF on users' persuasion awareness, with the automatic style increasing perceived persuasion and the on-demand style dampening perceived persuasion.

In addition to the mode and the invocation style dimension, the suggestive form is designed in terms of content it features. The suggestive form is redefined based on directivity (Silver 2006). Consistent with directivity, conclusion explicitness is one aspect extant PKM research has explored. According to this conclusion explicitness research, provision of content such as conclusion of persuasive arguments (e.g., ads) influenced consumers' persuasion awareness (e.g., Kardes 1988; O'Keefe 1997, 1998). Therefore, I argue that content is another characteristic of the suggestive form that is able to shape users' persuasion awareness. In the next section, I detail content elements that the suggestive form can be manifested.

3.2.2.2   Toulmin's Model of Argument as a Basis for Contents of Suggestive Form

According to PKM, explicitness of persuasion attempts in terms of message content has an impact on individuals' persuasion awareness. As Martin and Strong (2016) found, conclusion explicitness of message together with persuasion knowledge influenced consumers' trust in a brand and attitudes toward the brand. This indicates that explicitness of persuasion content plays a role in

persuasion awareness. That is, explicitness of persuasion content increases perceived persuasion beliefs of an agent.

To detail the content of the suggestive form, I utilize Toulmin's model of argument (Toulmin 1958, 2003), as it is a common model used in various settings (e.g., communication, law, IS) and offers more granular elements applicable to design persuasive messages. According to Toulmin (1958, 2003), there are six argument elements used in argumentation: 1) claim (C)—a conclusion or an assertion put forward for general acceptance, 2) data (D)—facts or beliefs regarding a situation supporting a claim, 3) warrant (W)—a statement that links data with a claim; that is assumed in general, 4) backing (B)—information which explains why a warrant or data should be accepted, 5) qualifier (Q)—an explicit reference to the degree of certainty a claim is made, and 6) rebuttal (R)—conditions which might undermine the warranted claim (Kim and Benbasat 2006; Toulmin 2003; Ye and Johnson 1995). This model of argument has been explored in IS literature. For example, Ye and Johnson (1995) investigated the effect of explanation facilities in expert systems on user acceptance. They suggested the use of explanation facilities so that expert systems "must be able to explain, in a form understandable to users, the reasoning processes it employs to solve problems and make recommendations." To explain the reasoning process behind the systems, they adopted the six elements of Toulmin (1958)'s model of argument which were expected to convince users. As another example, Kim and Benbasat (2006) employed the three elements of Toulmin (1958)—claim, data, and backing—to develop arguments to increase users' trusting beliefs in the e-commerce context. They found that providing a claim together with data or a claim together with data and backing increased consumers' trusting beliefs in an online store. Overall, the two studies indicate that Toulmin (1958)'s argument elements are applicable to design compelling content used in IS (e.g., explanation facilities, trust-assuring arguments).

Three elements—claim, data, and backing— are commonly found and the warrant element is generally assumed in online settings (Kim and Benbasat 2006). Following this, I detail the content element of the suggestive form in terms of claim, data, and backing. A *claim* is defined as a conclusion the suggestive PDF asserts. However, this does not limit to only a conclusion. Prior literature proposes that a claim can be manifested in terms of action/choice, recommendation, and standpoint (Fox and Modgil 2006). Thus, the claim element in the current research includes a conclusion, an action, a recommendation, and a standpoint that present a position an online entity takes. For example, the Apple TV application provides the "Watch Now" movie list to its users. This content shows an action. Presenting a recommendation, YouTube gives the "Recommended" video list on the top of its interface. Amazon offers the "Amazon's Choice" products indicating its standpoint. As a claim can take on a conclusion, an action, a recommendation, or a standpoint of an online entity, it shows an explicit direction on what to do to users. As a result, a suggestive PDF described in the previous section is featured by a claim.

Data refers to factual data used to establish a claim. For instance, Instagram's "Followed by [name], [name], and 37 others" tag attached with a post displays a fact about how many of others and users' followers follow a specific account. As another example, Booking.com shows "Only 3 rooms left!", "Booked 3 times in the last 6 hours" which are facts concerning the availability of hotel rooms and how many times a hotel was booked in a specified period. Netflix displays the "because you watched [movie name]" tag attached with a movie list. These data are facts provided by online entities. However, they are not like other kinds of data, such as product (e.g., hotel room, movie) descriptions and information regarding an online platform (e.g., about us). The data content of the suggestive form works as quasi-suggestive guidance from which users can infer a direction

concerning what to perform without giving an explicit suggestion. Consequently, I propose that a quasi-suggestive PDF defined previously can be featured in terms of data.

Additionally, the claim and the data element can be strengthened by backing and warrant. *Backing* is information that justifies why data or warrant should be accepted. In this manner, it would be present together with data or a warrant. If it is presented alone, it will serve as data. For instance, Netflix displays the "97% match" (B) attached to a movie in the "Because you watched [movie name]" (D) list. This percentage number helps justify why that particular movie is on the list. As a result, users can infer why they want to watch that movie based on the list together with the percentage match information Netflix provides.

Although claims, data, and backing are generally found in e-commerce settings, a *warrant* which links data to a claim (e.g., rules) can be provided. In this way, to be meaningful, it should be provided when a claim and data are present. For example, to support Netflix's "Top pick for you" movies and the "97% match", a warrant such as "A movie with higher than 70% match will be recommended" (fictitious information that Netflix does not provide) might be given.

Unlike a claim and data, backing and a warrant do not give a direction and thus work as a supporting role. In this case, they align with an explanation facility, another dimension of DSS design which facilitates users' decision-making tasks. Explanation facility refers to "the ability to explain knowledge and reasoning" (Dhaliwal and Benbasat 1996, p. 343) and is an important feature of the knowledge-based system (KBS) which is a subset of DSS (Gregor and Benbasat 1999). Dhaliwal and Benbasat (1996) propose that the use of explanation fosters user's learning, which, in turn, influences users' decisions and acceptance of a system. They reason that the explanation facility facilitates users' learning through intention clarification, knowledge transfer,

and convincing. In their study, there are three types of explanation—why, how, and strategic explanation. Why-explanation provides justification for why specific information is important. How-explanation presents details of how information is used. Strategic-explanation gives information regarding meta-knowledge. Following this, backing which provides information supporting data or warrant reflects how-explanation, whereas warrant that justifies data for a claim is in line with why-explanation.

Prior research has shown the positive effect of explanation facilities on users' decisions and perceptions. For example, Limayem and DeSanctis (2000) incorporated an explanation facility to decision guidance designed to support group decision-making tasks. They found that this guidance had positive impacts on users' learning (e.g., understanding of decision model) and decisions (e.g., decision quality). In addition, the explanation facility has been studied in the domain of recommendation agents (RA). RAs refer to "software agents eliciting the interest or preferences of individual users for products, either explicitly or implicitly, and make recommendations accordingly" (Xiao and Benbasat 2007, p. 137). For instance, Wang and Benbasat (2007) investigated the impact of explanation facilities an RA provides on users' trust. They studied three types of explanation. Following the KBS literature, how and why-explanation were used to provide information regarding how recommendations were generated and regarding the purpose of the RA's questions, respectively. The trade-off explanation gave information regarding trade-offs among product attributes. Their study reveals that the use of explanation facilities positively influences users' trust. Explanation facilities literature lends support to how adding backing or a warrant to a suggestive PDF will assist users in their decision tasks.

The two content elements—claim and data—used in this current research can be presented alone or combined (Kim and Benbasat 2006). Although Toulmin (2003) proposes that arguments should include at least a claim and data, I expect that either claim or data will suffice, as suggested by examples I found in the field. Also, research on conclusion explicitness (e.g., Martin and Strong 2016) supports its impact on individuals' persuasion awareness and behaviors. Specifically, when a conclusion is omitted, individuals infer a direction of what is good from data, thereby decreasing perceived persuasion. This suggests that data can be presented alone and influence individuals' persuasion awareness. Similarly, a conclusion or claim can be presented without data. Accordingly, presenting only a claim or a data piece should affect users' persuasion awareness and subsequent responses in my thesis.

As argued above, the claim-only content is a suggestive PDF, while the data-only content features a quasi-suggestive PDF. When a claim or data is presented, backing and/or warrant can be given. If backing is given alone, it is just data. Consequently, it should not be presented alone. As a warrant only offers a rule without giving or implying a direction regarding what to act, providing it alone cannot enable persuasion and thus should be with a claim and data. Overall, there are six possible content element manifestations: 1) claim only (C), 2) data (D), 3) claim plus data (C + D), 4) claim plus data and backing (C + D + B), 5) claim plus data and warrant (C + D + W), 6) claim plus data, backing, and warrant (C + D + B + W).

Furthermore, the content elements discussed in Toulmin's argument are related to persuasion explicitness (O'Keefe 1997, 1998). Table 7 presents the relationships among the suggestive form, Toulmin's content elements, and persuasion explicitness.

Decisional Guidance (Silver 2006)	Content Element (Toulmin 2003)	Persuasion Explicitness (O'Keefe 1997, 1998)
Suggestive	Claim	Explicit advocated position
	- Conclusion	- Conclusion
	- Action	N/A
	- Recommendation	- Recommendation
	- Standpoint	- Standpoint
Quasi-suggestive	Data	Implicit conclusion
Informative	Backing	Argument completeness
	Warrant	Argument completeness, Information source citation
N/A	Qualifier	Quantitative
Explanation facility	Rebuttal	N/A

Note: Grey cell – not included in my study

Table 7. Suggestive Form of PDF, its content, and relationships with persuasion explicitness

While Toulmin's argument elements are applicable to apply to various contexts, two main parts of arguments used in persuasion—1) conclusion and 2) support—were proposed to influence individuals' perceptions, such as trust and attitudes toward persuasion agents, by O'Keefe (1997, 1998). The conclusion part resembles Toulmin's claim element. The support part can take on several ways 1) information source which is part of Toulmin's warrant (Fox and Modgil 2006), 2) argument completeness which reflects Toulmin's warrant and backing, and 3) quantitative which partly fits with Toulmin's qualifier. Persuasion explicitness has been studied in persuasion literature. Prior studies investigate the persuasiveness of messages designed to change the audiences' attitudes and/or behaviors (e.g., Kardes 1988; O'Keefe 1997, 1998). In this domain, persuasive messages are conceptualized in terms of "message explicitness." Message explicitness is defined as the degree to which a persuasive message clearly conveys the advocated position of

a persuasion agent. The advocated position includes conclusion, recommendation, and standpoint. There are two types of message explicitness—*conclusion* and *support explicitness*. This conclusion explicitness is the concept used in Martin and Strong (2016). The classification of persuasion explicitness is summarized in Figure 4.
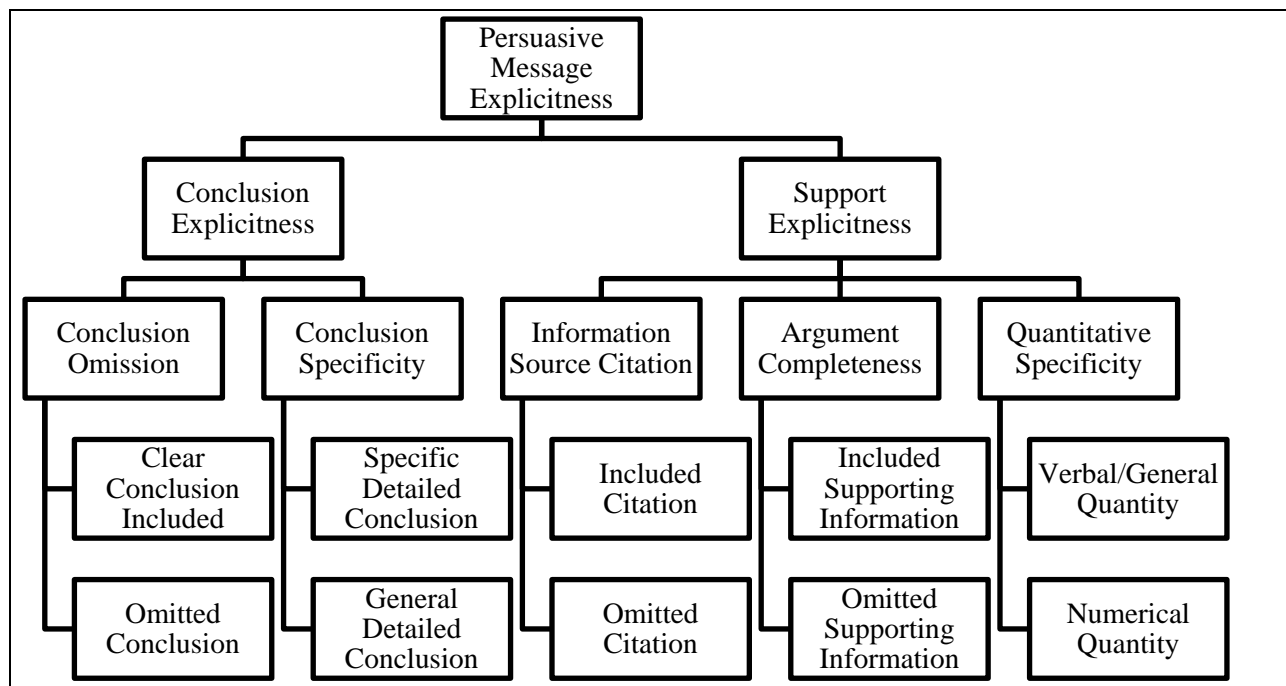
Figure 4. Persuasion explicitness (summarized from O'Keefe 1997; O'Keefe 1998)

O'Keefe (1997) refers conclusion explicitness to "the degree of articulation of the message's overall conclusion, recommendation, or standpoint" (p. 2). He conducted a meta-analysis to evaluate persuasiveness of conclusion explicitness. In his study, conclusion includes the conclusion of message, the recommendation which requests a specific action the message advocates, or a standpoint of the message. According to this view, persuasive messages are conceptualized as an implicit-explicit conclusion continuum. Compared with an explicit conclusion, an implicit conclusion is more ambiguous, thereby making a message key unclear.

O'Keefe (1997) asserts that overall conclusion explicitness can be manipulated in two instantiations—*conclusion omission* and *specificity*. The two instantiations are orthogonal. The conclusion omission deals with the message's conclusion. Thus, an explicit conclusion is a message which states a clear conclusion, or recommendation, while an implicit conclusion does not do so. On the other hand, conclusion specificity focuses on the form of a message. This refers to the degree to which a conclusion is detailed. While the conclusion described in more detailed is explicit, the conclusion with a few details is implicit.

O'Keefe (1997) argues that the message with an explicit conclusion is more persuasive than the message with an implicit conclusion. The underlying reason is "greater explicitness opens the advocated view for critical scrutiny" (O'Keefe 1997, p. 1). When individuals carefully inspect persuasive messages, they are more likely to be influenced by that message. Also, conclusion explicitness enhances the individuals' imagination of performing behavior and perception of behavioral control, thus leading to an advocated action. However, as O'Keefe (1997) notes, the persuasiveness of a conclusion might be compromised for two reasons. The first reason is due to disagreement space. The more an individual closely examines persuasive messages, the more likely she comes up with counterarguments. The other reason is a boomerang or backfire effect. Specifically, the message with an explicit conclusion can induce individuals' negative emotions and reactance. This will result in an opposite outcome a persuader expects, because the individuals want to restore their threatened freedom. The results of his study provide support to the persuasiveness of conclusion explicitness. This is consistent with Cacioppo et al. (1981) who suggest that the explicit message, one with a clear conclusion, is more desirable for persuasion than the implicit message, one with an open conclusion.

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Although the persuasiveness of explicit messages receives support, there is contradictory evidence for the persuasiveness of conclusion implicitness. O'Keefe (1997) remarks on the benefit and the concern of conclusion explicitness. From a positive standpoint, implicitness allows individuals to infer a conclusion or recommendation of the message by themselves. This indicates the individuals' active participation which is found to trigger persuasion. For instance, Kardes (1988) studies advertising messages in terms of conclusion omission. Results indicate that the ads with an implicit conclusion, the omitted conclusion, led to more favorable and more accessibility of attitudes toward a brand than the ads with an explicit conclusion. As another example, Moyer-Gusé et al. (2012) examined the effect of explicit persuasive appeal on the audience's attitudes toward drinking and driving in the domain of entertainment education. They found that those exposed to the message with an explicit conclusion reported more favorable attitudes toward the two undesirable behaviors, whereas those watching the dramatic TV narrative followed by such message showed less favorable attitudes. Their findings reveal the moderating role of conclusion explicitness. Overall, these studies suggest the promising effect of message explicitness.

In sum, the explicitness of conclusion influences not only the persuasiveness of persuasion attempts (e.g., ad messages), but also persuasion awareness. As suggested by PKM research (Martin and Strong 2016), conclusion explicitness (implicit, open-ended vs. explicit, close-ended conclusion) is associated with persuasion awareness and thus attitudes toward agents. That is, an implicit conclusion will dampen perceived persuasion, thereby increasing favorable attitudes toward persuasion agents. In my research, a suggestive PDF can give a claim (e.g., conclusion or recommendation) to users explicitly, whereas a quasi-suggestive PDF can provide data which users can infer a direction of behavior. Consequently, the design of the suggestive form is in line with the notion of conclusion explicitness. In particular, a suggestive PDF such as "a product

recommended for you" has a higher degree of conclusion explicitness. In contrast, a quasi-suggestive PDF such as the best-selling product has a lower degree of conclusion explicitness. In this case, users can infer the suggestion from the best-seller.

In addition to the message conclusion, the supporting message plays a role in influencing the effectiveness of persuasive messages. O'Keefe (1998) studies this support explicitness. Conducting another meta-analysis, he investigated whether explicitness of support impairs or strengthens the persuasiveness of messages. He argues that support explicitness can lead to individuals' trust (competence and integrity) in messages and thus increase persuasive effectiveness. Thus, the main outcomes are attitude change and trust. In his analysis, he defined three ways to manifest support explicitness—information-source citation, argument completeness, and quantitative specificity. Like the overall conclusion, supporting information can be conceptualized as an implicit-explicit continuum. The explicit extreme consists of a supporting message which identifies the source, provides underlying reasons for the conclusion, or offers specific quantitative information. On the other hand, the implicit extreme includes a supporting message which omits the source, leaves underlying reasons for the conclusion implicit, or provides general quantitative information. Results show that support explicitness had positive impacts on persuasiveness and trust. Specifically, the source of information and the argument completeness had positive effects, whereas the effect of quantitative specificity was not significant. This demonstrates that providing additional support to the message's conclusion can increase the message's persuasiveness and trust.

I argue that, like conclusion explicitness which has an impact on persuasion awareness (Martin and Strong 2016), explicitness of supporting information will shape the individuals' persuasion

awareness. That is, the high degree of support explicitness will heighten persuasion awareness, while the low degree of support explicitness will not do so. In my research, the suggestive and the quasi-suggestive PDF are relevant to decision tasks to users. Accordingly, a PDF which provides supporting information such as warrant and/or backing will influence users' persuasion awareness, with a high degree of explicitness increasing awareness.

Table 77 in Appendix B represents examples of persuasive design features adopted by various online entities.

3.2.3 Transparency Mechanisms

Online platforms such as Facebook have paid more attention to provide transparency tools to their users to increase their persuasion awareness (Goldman 2017). Transparency has been widely explored in diverse domains, such as support systems (expert systems, KBS, product recommendations), privacy, organization, and machine learning. Table 8 presents examples of how transparency is defined in different domains.

Source	Transparency Terms	Definition	Context
Dhaliwal and Benbasat (1996)	Explanation facility	"The ability to explain knowledge and reasoning" (p. 343)	Expert systems
Awad and Krishnan (2006)	Information transparency	Knowledge about the information a firm collects about users and how that information is used	Information privacy, personalization
Nicolaou and McKnight (2006)	Control transparency	"… the amount and type of information available to interested parties … That is, transparency	Electronic data exchange

Source	Transparency Terms	Definition	Context
		denoted the selective exchange of sensitive information to reduce opportunistic behavior." (p. 336)	
Wang and Benbasat (2007)	Explanation facility	Knowledge about an RA's actions to make it more transparent to its users and guide users' decision making	Product recommendation agents
Bonsón et al. (2012)	Web-based transparency	"the extent to which an organization makes information available through the internet" (p. 123)	E-government
Lasorsa et al. (2012)	Accountability and transparency	"accountability and transparency regarding how they [journalists] conduct their work, and sharing user-generated content with their followers" (p. 19)	Twitter
Leonardi (2014)	Message transparency	"people can literally see what others are saying to one another" (p. 804)	Knowledge sharing through social media
Xu et al. (2014)	Trade-off transparency	"explanations about how certain attributes are related to one another and that users should not overestimate their needs when indicating their product attribute preferences to the RA" (p. 382)	Product recommendation agents
Schnackenberg and Tomlinson (2016)	Organizational transparency	"Transparency is the perceived quality of intentionally shared information from a sender." (p. 1788)	Organization

Source	Transparency Terms	Definition	Context
Karwatzki et al. (2017)	Information-use transparency	"the extent to which an online service provider informs users about how and for what purpose acquired information is used as well as about which control features are available as required by law" (p. 382)	Information privacy, personalization
Arrieta et al. (2020)	eXplainable AI (XAI)	"… proposes creating a suite of ML techniques that 1) produce more explainable models while maintaining a high level of learning performance (e.g., prediction accuracy), and 2) enable humans to understand, appropriately trust, and effectively manage the emerging generation of artificially intelligent partners" (p. 83)	Machine learning

Table 8. Examples of transparency and related terms' definition in multiple disciplines

According to these examples, transparency focuses on information or knowledge that aims to enlighten users. In this case, it aligns with informative decisional guidance that does not give a direction regarding what to do to users both explicitly and implicitly (Silver 2006). However, transparency information in this thesis differs from backing and warrant of suggestive content discussed in 3.2.2.2. While backing and warrant are used to support a claim or data content, transparency information in this thesis aims at enhancing users' persuasion awareness. As PKM posits, the three knowledge structures are appliable to enable persuasion awareness—agent, persuasion, and topic knowledge. Thus, my transparency information is used to educate users

about agents, persuasion tactics, and topics at hand. Accordingly, I define "transparency mechanisms" as specific ways in which an online entity can be designed to affect the degree to which users are aware of being influenced. Following this, I define "transparency information" as information which transparency mechanisms provide to enhance or dampen users' perception of being influenced.

In PKM, persuasion knowledge activation is central to persuasion awareness. Although individuals possess some existing knowledge about persuasion, this might not be activated when exposed to persuasion attempts. As PKM predicts, "when a person begins conceiving of an agent's action, heretofore not identified as having any particular meaning, as a persuasion tactic a "change of meaning" will occur" (Friestad and Wright 1994, p. 13). That is, the change-of-meaning principle helps enlighten individuals to recognize persuasion tactics implemented by an agent, thereby leading them to interpret those tactics as persuasion attempts. In PKM, the authors gave an example of the similarity tactic used in a product presentation. If an individual is naive about this tactic or her existing knowledge about this tactic is not activated, she will be less likely to interpret the similarities between those in the presentation and her as a persuasion attempt. That is, she attaches no particular meaning to that tactic. The change of meaning comes into play to give information concerning how similarities of the characteristics in the presentation work. Consequently, she will be more likely to perceive that the presentation is trying to persuade her more than providing product information to her. Following the change-of-meaning principle, I propose that persuasion transparency information can enhance users' perceived persuasion and decrease their perceived assistance of an online entity.

Prior research has confirmed the effect of persuasion transparency information in triggering individuals perceived persuasion. For instance, Williams et al. (2004) found that disclosing a persuasion tactic used in the form of a research abstract heightened individuals' perceived persuasive intent. As another example, Cowley and Barron (2008) presented a product ad without explaining a specific tactic employed. Although a specific persuasion tactic was not disclosed, the presence of an ad reminded individuals about the motive for the implemented tactic. It triggered individuals' perceived persuasive intent. The former example shows that information regarding a specific tactic used can enhance individuals' perceived persuasion. This is also the case for the latter that presents information regarding general persuasion (i.e., an ad is used to promote a product), thereby triggering perceived persuasion as well. In line with this, I define "persuasion transparency information" as information concerning persuasion tactics (specific or general) used in the suggestive form of PDF.

In addition, Petty and Cacioppo (1986b) argue that revealing information about a persuasion target can make individuals aware of persuasion. In a similar vein, Facebook has offered persuasion target information to its users when they click "Why I am seeing this?" on an ad. For instance, Facebook details that "One reason you're seeing this ad is that [company name] wants to reach people interested in [subject], based on activity such as liking Pages or clicking on ads. There may be other reasons you're seeing this ad, including that [company name] wants to reach people ages [age in years] and younger who live or were recently in [country name]. This is information based on your Facebook profile and where you've connected to the internet." Therefore, I refer "persuasion target information" to information regarding targets of the suggestive form of PDF.

Moreover, agent information plays a role in individuals' persuasion awareness. I define "agent information" as information regarding a persuasion agent, such as an online entity or a company that aims to influence. Specifically, there are two types of agent information that can influence users' persuasion awareness in my thesis. First, agent background information focuses on activities done by an agent. Prior research found that those who were familiar with or knew about an agent were less likely to perceive persuasion of such agent (Hibbert et al. 2007; Wei et al. 2008). Since users can learn about an agent from agent background information an online entity provides, these users will perceive persuasion less. This type of information aligns with Facebook's page transparency that provides information about page activities, as well as page history. Secondly, online platforms have implemented small tags to reveal agent intent information, such as "Sponsored" (Facebook) and "Paid partnership with [a company]" (Instagram). Agent intent information identifies an agent supporting the suggestive PDF. Williams et al. (2004) reveal that if an agent supporting a persuasion action has a self-interested intent, individuals have higher perceived persuasion. However, if an agent sponsoring such action seems to have an objective intent, individuals' perceived persuasion is not heightened. This is in line with Wang et al. (2018). In their study, sponsorship disclosure for biased recommendation agents (RAs) increases users' distrust and decreases trust in RAs. Also, for organic RAs, providing explanations together with sponsorship disclosure increases users' trust. As trust in an agent (RA) aligns with users' agent knowledge, agent information that specifies the presence of a supporting party (a company) will influence users' persuasion awareness. Overall, agent information can enhance or dampen users' persuasion awareness.

Finally, PKM proposes that individuals with high topic knowledge would be less likely to be aware of persuasion. Thus, I include topic information as another type of transparency information that

can shape users' persuasion awareness. I define "topic information" as information regarding a topic of persuasion. Online platforms can educate users about the topic. For instance, Amazon.com provides an article about a product (e.g., notebook). Facebook automatically features information about COVID-19 vaccines (i.e., COVID-19 vaccines go through many tests for safety and effectiveness and are then monitored closely.) when someone posts or shares information about the vaccines. Although this information Facebook has provided aims to deal with fake news, this topic information can be implemented to dampen users' perceived persuasion. As a result, this kind of information enlightens users about the topic and thus makes them rely less on their persuasion knowledge when evaluating an online entity.

Owing to Petty and Cacioppo (1986b), the timing of information provision influences users' persuasion awareness, in addition to transparency information. They posit that forewarning that gives information about persuasion before seeing persuasive messages makes individuals aware of perceived persuasion than providing information after they see such messages. In PKM research, transparency information is disclosed before, concurrent with, or after persuasion attempts take place. Cowley and Barron (2008) show a product ad (general persuasion information) prior to a persuasion attempt. Williams et al. (2004) present a sponsor tag at the same time as a persuasion action appears. Campbell (1995) displays agent information after individuals are exposed to a persuasion action. Also, Facebook's persuasion target information disclosure that requires users to click to see such information suggests another timing—active timing. Taken together, I assert that there are four timings transparency information can be presented. *Advance* timing reveals transparency information before users see the suggestive PDF. *Delayed* timing discloses transparency information after users encounter the suggestive PDF. *Passive* timing

presents transparency information without users' requests and together with the suggestive PDF (concurrent). *Active* timing manifests transparency information upon users' requests.

Table 9 summarizes the four main types of persuasion transparency information and four timings as well as their manifestations in the field. It appears that online entities, especially Facebook and other networking sites, have implemented agent information in four different timings. For topic information, it requires users to click to see more information or appears together with persuasion actions. Persuasion target information is shown upon users' click. However, to the best of my knowledge, persuasion transparency information has not been implemented in the field.

Transparency Information	Transparency Timing			
	Advance	**Delayed**	**Active**	**Passive**
Persuasion transparency	N/A	N/A	N/A	N/A
Persuasion target transparency	N/A	N/A	- Why am I seeing this? (Facebook)	N/A
Agent transparency	- This program brought to you by [company] (TV programs) - Page transparency (Facebook)	- Mysterious ads (Campbell 1995)	- About the partnership/website (Facebook)	- Sponsor tag (Facebook) - Paid partnership with [company] (Instagram) - [Channel] is funded in whole or in part by [organization]. (YouTube)

Transparency Information	Transparency Timing			
	Advance	Delayed	Active	Passive
Topic transparency	N/A	N/A	- Get Vaccine Info (Facebook) - Learn about US 2020 election security efforts (Twitter)	- COVID-19 vaccines go through many tests for safety and effectiveness and are then monitored closely. (Facebook)

Table 9. Transparency mechanisms design and examples in the field

3.3 A Theoretical Model of Persuasion Awareness in Online Settings

My theoretical model draws on three main bodies of literature: 1) Persuasion Knowledge Model (PKM, Friestad and Wright 1994), which outlines how persuasion awareness takes place and how possible transparency mechanisms can be designed, 2) Decision Support System (DSS, Silver 1990, 2006) that identifies forms, modes, and invocation styles of persuasive design features (PDFs) used in online settings, and 3) Toulmin's model of argument (Toulmin 1958, 2003) detailing specific contents in which the suggestive form of PDFs is carried out in online settings. The proposed theoretical model is depicted in Figure 5.

In the remainder of this section, I present a theoretical model and hypotheses concerning the relationships among the PDF characteristics, persuasion awareness constructs, and relevant constructs.
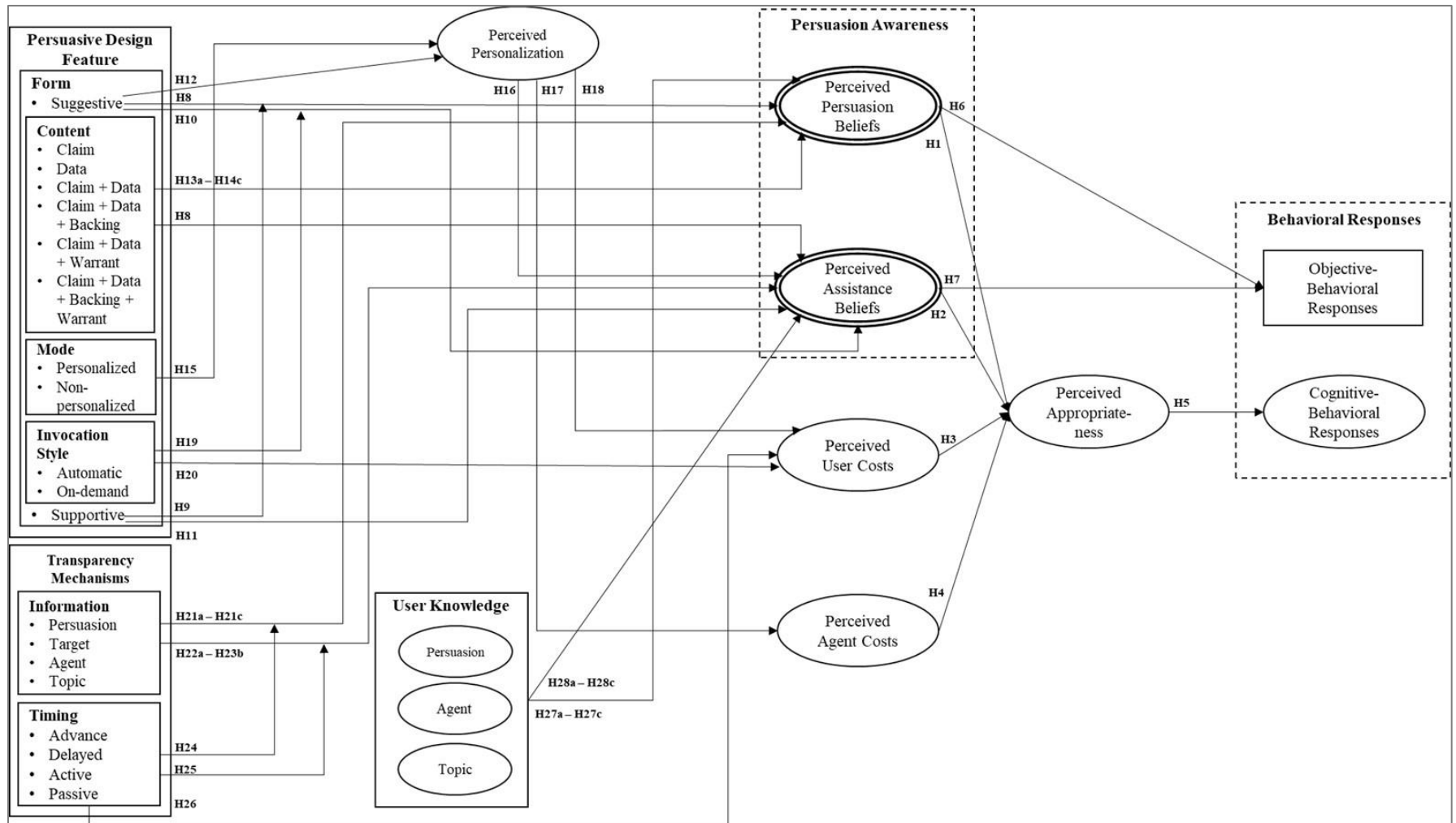
Note: Rectangles – observable constructs; ellipses – non-observable constructs; double-lined ellipses – higher-order constructs; the perceived persuasion beliefs high-order construct underlines perceived persuasive intent and perceived agent benefits; the perceived assistance beliefs higher-order construct underlines perceived assistive intent and perceived user benefits

Figure 5. A Theoretical model of persuasion awareness in online settings

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In this model, an online entity (e.g., e-commerce website, social networking site, online application) serves as a persuasion agent designing its PDFs to influence users, a target of persuasion. Such PDFs (e.g., product recommendations) trigger a persuasion episode with which users interact. If users interpret that persuasion episode as a persuasion attempt, they will be more likely to engage in some forms of behavioral responses (i.e., positive/negative attitudes toward an online entity, acceptance/rejection of a product recommended). Table 10 summarizes the key characteristics of PKM, their definition, and their manifestation in the current research.

Persuasion Knowledge Model	Definition	Manifestation in the Current Research
Target	"those people for whom a persuasion attempt is intended (e.g., consumers, voters)" (p. 2)	Users who are exposed to PDFs serving as persuasion attempts
Agent	"whomever a target identifies as being responsible for designing and constructing a persuasion attempt (e.g., the company responsible for an advertising campaign; an individual salesperson)" (p. 2)	An online entity that delivers PDFs to users
Persuasion episode	"From a consumer's perspective, the directly observable part of an agent's behavior" (p. 2)	PDFs that users encounter
Persuasion attempt	"a target's perception of an agent's strategic behavior in presenting information designed to influence someone's beliefs,	Persuasion awareness – users' perception that an online entity designs PDFs to influence them

Persuasion Knowledge Model	Definition	Manifestation in the Current Research
	attitudes, decisions, or actions" (p. 2)	
Persuasion coping behaviors	"encompasses not only their cognitive and physical actions during any one persuasion episode, but also any thinking they do about an agent's persuasion behavior in anticipation of a persuasion attempt, as well as between and after episodes in a campaign" (p. 3)	Users' behavioral responses to PDFs

Table 10. The manifestation of the persuasion knowledge model in online settings

3.3.1 Persuasion Awareness in Online Settings

Online users are exposed to PDFs which serve as a persuasion platform. Following PKM, they can perceive PDFs either as more assistive, as more persuasive, or as both, thus driving their judgments and behaviors. I propose that 1) the perceived assistance beliefs higher-order construct reflects perceived assistive intent and perceived user benefits and 2) the perceived persuasion beliefs higher-order construct underlines perceived persuasive intent and perceived agent benefits. As PKM and existing persuasion awareness literature posit (Campbell 1995; Robertson and Rossiter 1974), perceived assistance and perceived persuasion of an agent will influence the individuals' overall evaluation of its action, perceived appropriateness of such action, and thus their behavioral responses, such as attitudes and behaviors. In this case, perceived assistance will increase perceived appropriateness, whereas perceived persuasion will decrease perceived appropriateness.

Consequently, I argue that PDFs that reflect an online entity's action will be interpreted as either assistive, persuasive, or both. This, in turn, will result in users' perceived appropriateness of an online entity that provides such PDFs and thus their behavioral responses. Thus, I hypothesize:

H1: Perceived persuasion of online entities will decrease perceived appropriateness of online entities that provide PDFs.

H2: Perceived assistance of online entities will increase perceived appropriateness of online entities that provide PDFs.

Additionally, Campbell (1995) found that perceived costs associated with a persuasion episode—individual costs (e.g., attention, processing effort, involvement used in processing a persuasion attempt) and persuader costs (e.g., money, time, effort used in triggering a persuasion attempt) affected individuals' perceived appropriateness. That is, individual costs diminished perceived appropriateness, while persuader costs strengthened perceived appropriateness. In a similar vein, I define 1) perceived user costs as users' perception that they attend to PDFs, spend their effort in processing it, or get involved with it, and 2) perceived agent costs as users' perception that an online entity exerts time and effort in designing and delivering PDFs. Thus, I hypothesize:

H3: Perceived user costs will decrease perceived appropriateness of online entities that provide PDFs.

H4: Perceived agent costs will increase perceived appropriateness of online entities that provide PDFs.

PKM and persuasion awareness research (e.g., Campbell 1995; Robertson and Rossiter 1974; Williams et al. 2004) argue that perceived appropriateness will lead to behavioral responses, both cognitive and objective. For cognitive-behavioral responses, resistance, attitudes toward a

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persuasion agent, attitudes toward a persuasion attempt, and purchase intention are outcomes. Prior research found that perceived appropriateness had positive relationships with cognitive responses, such as positive attitudes towards an agent and a brand, and purchase intention (e.g., Campbell 1995). Also, extant research proposes that resistance can be developed if individuals perceive that a persuasion attempt is not appropriate (e.g., Rains and Turner 2007; White et al. 2008). In my study's context, if an online user has high perceived appropriateness, she will be more likely to engage in positively cognitive-behavioral responses (less resistance, positive attitudes towards an online entity, and increased intention to interact with an entity). Thus, I hypothesize:

H5: Perceived appropriateness of online entities that provide PDFs will increase users' positively cognitive-behavioral responses.

Moreover, PKM predicts that individuals will engage in coping behaviors when their persuasion knowledge is triggered. In other words, when individuals know that they are being persuaded, they are more likely to cope with a persuasion attempt. According to Petty and Cacioppo (1986b), there are three possible coping behaviors in persuasion—simple rejection, active counterargument, and careful scrutiny. Simple rejection refers to "discounting the message without considering it," active counterargument refers to "actively counterargue the message drawing upon previous knowledge in order to attack the message to the best of one's ability," and careful scrutiny refers to "more carefully scrutinize the message arguments" (p. 173). This scrutiny might lead to acceptance or rejection of persuasive messages. The three coping behaviors can be categorized into problem-focused coping and emotion-focused coping based on Coping Theory (Lazarus 1993; Lazarus and Folkman 1984). Problem-focused coping is defined as a behavioral response targeting the source of the threat, whereas emotion-focused coping is defined as a behavioral response attempt to

mitigating negative emotions without tackling the source of the threat. IS research has studied coping behaviors in the domain of IS security and privacy (Bulgurcu 2012; Chen et al. 2021; Liang and Xue 2009; Liang et al. 2019; Wang et al. 2017).

As PKM describes, the objective of persuasion knowledge is to make individuals aware of persuasion attempts and respond to them "in a way that achieves their own goals." Thus, careful scrutiny would be an expected outcome when individuals perceive persuasion of an agent. That is, an individual carefully evaluates a persuasion action. When the persuasion action does not undermine her goal, she is likely to accept the persuasion attempt. On the other hand, she is likely to resist the persuasion attempt if the persuasion action does not fit with her own goal. This shows that coping behaviors involve not only persuasion backfire, but also careful evaluation of persuasion attempts. In this thesis, acceptance and rejection of the PDFs, as well as careful evaluation, reflect objective-behavioral responses. As these behaviors can be observed in online settings, I categorize these behaviors into objective responses. For instance, if a user adds a recommended product into their consideration set through a website compare feature and selects it to purchase, she carefully evaluates this recommended one against others and also accepts it. On the other hand, if she does not add the recommended one to compare and does not choose it, she just simply ignores it. Or she just accepts it without viewing it or compare it with others. The latter cases refer to simply rejection and simply acceptance, respectively. These indicate that she does not engage in careful evaluation and decision-making. Thus, perceived persuasion will influence objective responses.

Following PKM, perceived persuasion will shape individuals' objective-behavioral responses (Friestad and Wright 1994). Without being aware of persuasion attempts, users will be less likely

to carefully evaluate persuasion actions. In other words, perceived persuasion will have a positive impact on careful decisions. In addition, persuasion awareness research suggests perceived assistance will have a positive effect on individuals' cognitive and behavioral responses (e.g., Campbell and Kirmani 2000). That is, those who feel the assistance of an agent will be more likely to consider or accept an agent's persuasion attempt. As a result, I predict users' perceived persuasion will have a positive impact on their objective responses, such as careful evaluations and acceptance if they see fit. Also, users' perceived assistance will positively affect their objective responses. Thus, I hypothesize:

H6: Perceived persuasion of online entities will increase users' objective-behavioral responses.

H7: Perceived assistance of online entities will promote users' objective-behavioral responses.

3.3.2   Effects of PDF Forms on Users' Persuasion Awareness

Users would be less likely to be aware of persuasion attempts (e.g., Netflix's movie recommendations) in online settings. One reason would be information overload in this specific context. Unlike a limited number of persuasive messages given at a time in an offline environment, an online platform has lots of contents which are applicable for persuasion. In my study, there are two forms of PDFs—a suggestive and a supportive form.

3.3.2.1   Effects of PDF Forms on Users' Perceived Persuasion

The suggestive form ranges from a not suggestive to a quasi-suggestive to a suggestive PDF. The suggestive PDF provides an explicit direction concerning what to do to users (e.g., what to watch, what to buy). In contrast, the quasi-suggestive PDF gives information that users can infer a recommendation regarding what to act without suggesting an explicit direction. The quasi-

suggestive information can be an objective fact (e.g., best-seller, low in stock) or social information (e.g., what others buy, how many others booked this hotel). According to social influence literature, social information can serve as an informational influence (Burnkrant and Cousineau 1975). This is consistent with DSS literature regarding a record of behavior in similar contexts. Thus, the quasi-suggestive PDF can provide information regarding how others make decisions on a particular topic (e.g., the number of others viewing this product right now).

Prior research demonstrates that individuals with limited cognitive capacity were less likely to be aware of a persuasion action (Campbell and Kirmani 2000; Williams et al. 2004). As information overload can limit online users' cognitive capacity, exposure to the online platform is less likely to induce their persuasion knowledge and thus persuasion awareness. However, the suggestive PDF that reveals information regarding what the online entity expects users to do will require less cognitive ability to process the persuasion attempt than the quasi-suggestive PDF which does not offer such information directly. Thus, the suggestive PDF will be more likely to trigger their persuasion knowledge and therefore perceived persuasive intent more than the quasi-suggestive one. As the quasi-suggestive PDF allows users to infer a direction by themselves, this induces users' perception of direct participation. As extant literature indicates, perceived direct participation will have a positive impact on individuals' perceptions (Petty and Cacioppo 1981). Consequently, I expect that the quasi-suggestive PDF will be less likely to induce users' perceived persuasive intent. As users will think that the direction they infer comes from their direct participation, the quasi-suggestive PDF will not differ from the not-suggestive PDF which does not offer an explicit or implicit direction. Thus, I hypothesize:

H8: Online entities that provide suggestive PDFs will increase users' perceived persuasion.

The online platform can also provide supportive PDFs such as filter and sort functionality. The supportive functionality helps users process information and make the decision easier (Todd and Benbasat 1991). Extant literature found that individuals' cognitive capacity moderated the effect of persuasive attempts on their perceptions (Campbell and Kirmani 2000; Williams et al. 2004). That is, when users' cognitive ability is unbusy, they are more likely to detect persuasion attempts and interpret such attempts as being persuasive. Thus, I hypothesize:

H9: The effect of the suggestive form of PDFs on users' perceived persuasion will be amplified when users are provided with the supportive form.

3.3.2.2   Effects of PDF Forms on Users' Perceived Assistance

Informational influence research suggests that information can influence individuals' decisions (Burnkrant and Cousineau 1975; Sussman and Siegal 2003). For instance, Sussman and Siegal (2003) utilized Elaboration Likelihood Model (ELM, Petty and Cacioppo 1986b) and Technology Acceptance Model (TAM, Davis 1989) to explain how users made a decision to adopt information in an organizational context. In their study, recommendations users received through emails were the focus. They found that the two message cues—argument quality and source credibility—played an important role in users' adoption of recommendations. Specifically, users who perceived that information was high in quality and source credibility developed their perception of information usefulness. Information usefulness was found to shape their decisions to adopt information.   This study shows that information cues affect users' perceived information usefulness and thus decisions.

As mentioned earlier, online users are overwhelmed with information. In this case, the suggestive form can serve as an informational cue. Assume a user enters Netflix to find a movie to watch.

There are a lot of movies available on this particular platform. To help her make a movie decision, Netflix can provide information cues such as "Top pick for you." She might find movies listed under that cue useful and select to watch them. In this vein, the information cues reflect the suggestive form of PDFs. "Top pick for you" fits with the suggestive PDF, whereas "Because you watched [a movie name] aligns with the quasi-suggestive PDF. Following informational influence research, the suggestive form will influence users' perception that an online platform assists them by providing such cues. As the not-suggestive PDF does not offer any explicit or implicit information cues to users, it will be less likely to induce users' perceived assistance. On the contrary, information cues such as the suggestive and the quasi-suggestive PDF will shape users' perceived assistance, as the information cues are added. However, I argue that there will be no difference between the two information cues. Thus, I hypothesize:

H10: Online entities that provide the suggestive form of PDFs will increase users' perceived assistance.

In addition, the supportive PDF which facilitates users' decision tasks would influence their perceived assistance. Providing support to users was found to positively affect users' perceptions, such as service quality, website usefulness, and satisfaction (e.g., Cenfetelli et al. 2008). In a similar vein, I argue that the supportive PDF will be applicable to induce users' assistance, as it indicates that an online entity provides it to support them. Thus, I hypothesize:

H11: Online entities that provide the supportive form of PDFs will increase users' perceived assistance.

According to Komiak and Benbasat (2006), *perceived personalization* is the degree to which an entity understands and represents users' needs. The suggestive form of PDF, such as a product

recommendation, often assists users by decreasing their difficulty associated with a decision task (East et al. 2005; Fitzsimons and Lehmann 2004). Parikh et al. (2001) found that the presence of decisional guidance increased users' satisfaction than no guidance. As the suggestive form of PDF is part of decisional guidance, it will increase users' satisfaction. Also, with technologies, recommendations or information is widely given to users without their requests. For example, Netflix recommends movies to users without users' requests. Consequently, it is possible that the presence of the suggestive form will elevate users' perceived personalization. Thus, I hypothesize:

H12: Online entities that provide the suggestive form of PDFs will increase users' perceived personalization.

3.3.2.3   Effects of Contents on Users' Persuasion Awareness

To specify contents in which the suggestive form can be carried out, I draw on Toulmin's model of argument (Toulmin 1958, 2003). According to my review on argument elements used in research and fields (see 3.2.2.2), I propose that there are six content manifestations in the proposed model: 1) claim-only (C), 2) data-only (D), 3) claim plus data (C + D), 4) claim plus data and backing (C + D + B), 5) claim plus data and warrant (C + D + W), and 6) claim plus data, backing, and warrant (C + D + B + W).

For the suggestive PDFs, the claim content presents a conclusion, an action, a recommendation, or a standpoint. It aligns with persuasion conclusions in O'Keefe (1997). He focuses on how conclusions in persuasive messages are associated with message persuasiveness and awareness of persuasive intent. In his research, he refers conclusion explicitness to the degree to which a persuader explicitly presents her opinions without omitting information related to her views. Unlike messages with explicit conclusions which offer clear conclusions or specific

recommendations, messages with implicit conclusions exclude conclusions or provide non-specific conclusions. He notes that implicit-conclusion messages leave conclusions or recommendations open to the audience's interpretation and thus are less likely to trigger counterarguments and negative perceptions. In this case, explicit-conclusion messages reflect the suggestive PDF that provides an explicit conclusion, while implicit-conclusion messages are in line with the quasi-suggestive PDF which does not give an explicit conclusion. To develop the content of the quasi-suggestive PDF, I argue that the data element can be used. Data such as "low in stock" or "39 friends like this" is a fact that users can infer meaningful information for their decision-making. In other words, data can imply a direction regarding how to act.

Conclusion explicitness has been examined in PKM research (Jeong and Lee 2013). Jeong and Lee (2013) found that providing an explicit conclusion increased the individuals' perceived persuasion, while giving an implicit conclusion did not. As a result, the claim content will be more likely to induce users' perceived persuasion more than the data content. Thus, I hypothesize:

H13a: For the content of the suggestive form, online entities that provide the claim-only (C) PDFs will enhance users' perceived persuasion of such entities more than those that provide the data-only (D) PDFs.

PKM research has implemented the notion of context congruity used in the covert marketing literature (Cowley and Barron 2008; Tutaj and van Reijmersdal 2012). Covert marketing refers to "attempts to expose consumers to brands by embedding them into outlets not typically considered advertising terrain" (Wei et al. 2008, p. 35). The strategy of covert marketing is "increasing congruency between brands and the media in which they are embedded can reduce the chance of alerting consumers that what they are seeing and/or hearing is actually a persuasive message" (Wei

et al. 2008, p. 35). In other words, the more congruent with the media product is, the less persuasion of such product presentation individuals perceive. Examples of this strategy are product placement in movies or television programs (Cowley and Barron 2008) and sponsored content on websites (Tutaj and van Reijmersdal 2012). In my research, a claim can be supported by additional elements such as data, backing, and/or warrant, resulting in four combinations: 1) claim + data, 2) claim + data + backing, 3) claim + data + warrant, and 4) claim + data + backing + warrant. Drawing on context congruity, I propose that the more content elements added to the claim content would be less likely to increase users' perceived persuasion. The underlying reason is that the additional elements can blend in with the claim content which serves as a context these elements are situated. In this way, adding elements such as data, backing, and/or warrant to the claim content will form high context congruity and thus will not increase its perceived persuasion. In contrast, the claim-only content will align with low context congruity that makes the claim-only content more obvious and thus leads to higher perceived persuasion. Thus, I hypothesize:

H13b: Online entities that add content(s) to a claim PDF (e.g., C + D, C + D + B, C+ D +W, C + D + B + W) will not increase users' perceived persuasion of such entities.

Data, backing, and a warrant can be categorized as argument support defined by O'Keefe (1998). He studies the role of supporting information in influencing the audience's perceptions and attitudes. He argues that the inclusion of specific supporting information (e.g., argument completeness, source citation, justification) enhances the audience's trust in the message and thus increases message persuasiveness. Kim and Benbasat (2006) adopted Toulmin's model of argument in developing arguments aiming to increase online consumer trust in online stores. In their study, the warrant element was omitted, as it is generally assumed. They found that providing

the argument combination as claim plus data and claim plus data plus backing increased the consumer trusting beliefs more than providing the claim alone. Also, they observed that the claim-data-backing combination worked best in enhancing the consumer trusting beliefs. Their study suggests that the more content elements are added, the higher users trust in an agent.

In addition, Wang and Benbasat (2016) found that explanation regarding performance such as "what the technology does to assist users" and explanation concerning such as "understanding of a technology" (p. 746) influenced users' trusting beliefs. This explanation can be in the form of data, backing, or warrant of the PDF content, since they are used to make support. Therefore, these elements are applicable to influence users' trusting beliefs. Prior literature identified three types of trusting beliefs in the e-commerce context: competence—"ability of the trustee to do what the truster needs," benevolence—"trustee caring and motivation to acts in the truster's interests," and integrity—"trustee honesty and promise keeping" (McKnight et al. 2002, p. 337). In this case, the benevolence component aligns with perceived assistance in my study, while the competence component partly reflects perceived usefulness. Thus, providing claim plus data (C + D), and claim plus data and backing (C + D + B) will strengthen users' perceived assistance more than providing claim (C) or data (D) alone. Also, users provided with the claim plus data and backing (C + D +B) will show higher perceived assistance than those given with the claim plus data (C + D). As the warrant element is implicitly assumed in general (Kim and Benbasat 2006), adding the warrant element will not influence users' perceived assistance. Thus, I hypothesize:

H14a: Online entities that add data only (C + D) to the claim content will strengthen users' perceived assistance of such entities more than those that provide PDFs with claim-only (C) and data-only (D) content.

H14b: Online entities that add both data and backing (C + D + B) to the claim content will strengthen users' perceived assistance of such entities more than those that provide PDFs with claim-only (C) and data-only (D) content.

H14c: Online entities that add warrant to the suggestive form of PDFs (C + D + W and C + D + B + W) will not increase users' perceived assistance of such entities than those without a warrant (C + D and C + D +B).

3.3.2.4   Effects of Modes on User's Persuasion Awareness

Drawn from Silver (2006), the suggestive form of PDFs can be designed in terms of two modes: 1) *non-personalized*—predefined by an online entity and 2) *personalized*—generated based on users' preferences. Prior literature found positive effects of personalization on users' perceptions and behaviors (e.g., Komiak and Benbasat 2006). Personalization is important. Without it, reactance can take place, as explained by Psychological Reactance theory (Brehm 1966). Brehm (1966) contends that when individuals experience a threat to their freedom through a constrained choice, they will engage in psychological reactance. Influencing individuals in a way that runs counter to their initial preferences can induce reactance.

In online settings, recommendations which match users' prior preferences are key. Fitzsimons and Lehmann (2004) found that for unsolicited product recommendations, those who were given product recommendations which ran counter to their existing attitudes resisted such recommendations. Following this, a fit between online users' preferences and the suggestive form or a personalized mode will lead to higher users' perceived personalization than a misfit or a non-personalized mode and thus persuasion acceptance. Perceived personalization is the degree to which users perceive that an online entity understands and represents their needs (Komiak and

Benbasat 2006). Extant personalization literature has found that perceived personalization affected the individuals' perception regarding the usefulness of using a system (Lee et al. 2010; Lee and Lee 2009). Users might like or dislike the personalized outcome. However, like it or not, users would perceive that the personalized PDF which is designed based on their preferences is trying to help them. Also, Komiak and Benbasat (2006) found that perceived personalization had positive impacts on trusting beliefs. As benevolence, trusting belief, is part of perceived assistance, I propose that the personalized mode will enhance users' perceived personalization more than the non-personalized one. Also, I argue that perceived personalization will shape their perceived assistance of an online entity. Thus, I hypothesize:

H15: Online entities that provide personalization will increase perceived personalization than those that do not provide personalization.

H16: Perceived personalization will enhance perceived assistance.

Moreover, the personalized mode takes users' preferences into account. As personalization can be perceived as an effort an online entity used in delivering a PDF, I argue that the PDF mode will escalate users' perceived agent costs. The personalized mode will have a positive impact on their perceived agent costs. Also, with personalization, users will be more likely to accept it. This indicates that perceived personalization will decrease users' costs associated with their decision task. Thus, I hypothesize:

H17: Perceived personalization will increase perceived agent costs.

H18: Perceived personalization will decrease perceived user costs.

3.3.2.5   Effects of Invocation Styles on Users' Persuasion Awareness

Of particular interest to my thesis, I adopt two invocation styles used in DSS from Silver (2006)—*automatic* and *on-demand*. In line with his research, I define an automatic style as a PDF which is provided automatically without users' request and an on-demand style as a PDF that is triggered upon users' request. More and more PDFs are given unsolicitedly, as a result of the power of technologies such as AI.

Compared to the automatic style, the on-demand style is less restrictive, since it allows users to choose whether they want to see the suggestive form of PDF. In other words, it gives more controllability to users. However, the on-demand style will be less likely to draw users' attention to a PDF, as an online entity needs to add an object (e.g., a button), allowing users to request such PDF. According to the context congruity proposes, the automatic style will be more likely to blend in with an online interface more than the on-demand style with a request object. Therefore, the on-demand style will be more likely to give rise to users' perceived persuasion more than the automatic style. Thus, I hypothesize:

H19: Online entities that employ the on-demand style will increase users' perceived persuasion than those employing the automatic style.

In addition, the on-demand style requires users to act to trigger the suggestive form of PDF. In this way, users will be required to exert some effort which is one aspect of perceived user costs. Thus, I hypothesize:

H20: Online entities that employ the on-demand style will increase users' perceived user costs than those employing the automatic style.

3.3.2.6   Effects of Transparency Mechanisms on Users' Persuasion Awareness

Online platforms, such as Facebook, try to provide transparency tools to their users to increase their awareness (Goldman 2017). In this chapter, transparency mechanisms are proposed to enhance users' persuasion awareness. PKM points out that educating individuals about persuasion knowledge helps them be aware of a persuasion attempt. Change of meaning which provides information regarding persuasion is one strategy which has been employed to activate individuals' persuasion knowledge. This information is not part of the suggestive form. The content elements of the suggestive form focus on information that users can explicitly or implicitly infer a direction on how to act (claim or data) and supporting information (backing and/or warrant) for establishing that direction. On the other hand, transparency information emphasizes additional information. Despite unrelated to the direction and its support in the suggestive form, transparency information aims to educate users to enhance their knowledge and presents independently from the suggestive form.

According to PKM research, providing information regarding persuasion tactics (Campbell and Kirmani 2000; Cowley and Barron 2008) or agent (Wei et al. 2008; Williams et al. 2004) is found to enhance perceived persuasion. Also, Petty and Cacioppo (1986b) suggest that advance warning or forewarning plays a role in persuasion. They suggest that forewarning individuals about a topic of persuasion will make the individuals ready to process persuasion messages, while forewarning about a target of persuasion will make them aware of persuasion. This suggests that providing different kinds of information persuasion will affect users' persuasion awareness differently.

Taken PKM research and persuasion literature together, there are four applicable types of *transparency information* that transparency mechanisms can provide—1) *persuasion transparency*

detailing information regarding a persuasion tactic (Campbell and Kirmani 2000; Wei et al. 2008), 2) *target transparency* offering information about a target of a persuasion attempt (Petty and Cacioppo 1986b), 3) *agent transparency* giving information regarding a persuasion agent that includes agent background (activities) and agent intent (Wei et al. 2008), and 4) *topic transparency* providing information regarding a topic of a persuasion attempt (Petty and Cacioppo 1986b). Prior research shows that providing different information affected persuasion awareness differently (e.g., Campbell and Kirmani 2000). In particular, providing information regarding persuasion and a target will enhance individuals' perceived persuasion and decrease perceived assistance more than providing information concerning a topic (Petty and Cacioppo 1986b). As PKM proposes that persuasion knowledge includes knowledge regarding persuasion tactics and individuals' own goals, persuasion transparency reveals such tactics and target transparency would make users' goals more accessible and thus trigger their perceived persuasion.

Also, agent intent disclosure will increase perceived persuasion and decrease perceived assistance (Williams et al. 2004). In contrast, agent background information will make individuals rely less on their persuasion knowledge (Friestad and Wright 1994). For instance, Wei et al. (2008) found that those who were familiar with a brand were less likely to activate their persuasion knowledge. For another example, Hibbert et al. (2007) found that those who knew a persuasion agent did not rely on their persuasion knowledge when evaluating the agent's action, thus leading to acceptance of such action. As argued above, individuals' agent knowledge has a positive effect on their trust in an agent, which, in turn, will affect perceived assistive intent (Foreh and Grier 2003; Wei et al. 2008). Similar to agent background information, PKM suggests that those who know about the topic will be less likely to detect persuasion attempts. However, the presence of topic transparency will strengthen users' perceived assistance, due to relevant information provided. As a result, I

argue that persuasion, target transparency, and agent intent transparency will fortify users' perceived persuasion and aggravate their perceived assistance. Agent background transparency and topic transparency will increase users' perceived assistance. Thus, I hypothesize:

H21a: Persuasion transparency will increase users' perceived persuasion.

H21b: Target transparency will increase users' perceived persuasion.

H21c: Agent intent transparency will increase users' perceived persuasion.

H22a: Persuasion transparency will decrease users' perceived assistance.

H22b: Target transparency will decrease users' perceived assistance.

H22c: Agent intent transparency will decrease users' perceived assistance.

H23a: Agent background transparency will increase users' perceived assistance.

H23b: Topic transparency will increase users' perceived assistance.

Additionally, extant research on PKM has manipulated the *timing* of information provision and found that the timing influenced persuasion awareness. The timing includes prior (e.g., Williams et al. 2004), concurrent with (e.g., Kirmani and Zhu 2007), or after (e.g., Campbell 1995) persuasion attempts take place. This timing notion timing is consistent with the warning time proposed by Petty and Cacioppo (1986b). They asserted the warning time as another factor contributing to the effectiveness of a warning message. They found that forewarning, which reveals information in advance, worked better than warning which was given after individuals received a persuasive message. Following these, I propose that there are four applicable timings of transparency mechanisms in online settings influencing users' persuasion awareness: 1) an *advance timing* (prior timing) which provides transparency information before users' exposure to PDFs and thus aligns with forewarning, 2) a *delayed timing* which provides transparency

information after users' exposure to PDFs, 3) an *active timing* which requires users' actions (e.g., click to see more information) to see transparency information, and 4) a *passive timing* (concurrent timing) that does not require users' actions to see transparency information and comes together with PDFs (e.g., "Sponsored" tag on Facebook). Although the advance, delayed, and passive timing can be carried out in offline settings, the active timing is facilitated by technologies. This indicates that how transparency mechanisms work differently in offline and online settings.

As mentioned earlier, advance warning is more effective in triggering persuasion knowledge more than delayed warning. In a similar vein, I contend that transparency information presented in advance timing will be more likely to amplify users' perceived persuasion and assistance more than that shown in delayed timing. As active timing requires users' action, it is difficult for users to see transparency information in the first place. Thus, active timing will be less likely to activate users' perceived persuasion than any other timings. Thus, I hypothesize:

H24: Online entities that provide transparency information to users before they encounter PDFs (advance) will amplify their perceived persuasion more than those providing transparency information after users see PDFs (delayed), at the same time as they are exposed to PDFs (passive), and upon users' request (active).

H25: Online entities that provide transparency information to users before they encounter PDFs (advance) will amplify their perceived assistance more than those providing transparency information after users see PDFs (delayed), at the same time as they are exposed to PDFs (passive), and upon users' request (active).

Furthermore, Campbell (1995) studied the effect of mysterious ads that show a sponsored brand at the end on consumers' perceived persuasion. She found that the time of brand identification was

significantly correlated with individual costs. A delayed mode aligns with the time of brand identification of mysterious ads. Following her study, I expect that delayed timing will be more likely to increase users' perceived user costs. Also, active timing requires users' activation. In this case, users will be more likely to perceive their own costs more than an advance and a passive timing. Thus, I hypothesize:

H26: Online entities that provide transparency information to users after they see PDFs (delayed) and upon users' requests (active) will increase perceived user costs.

3.3.2.7 Effects of User Knowledge on Persuasion Awareness

As PKM posits, individuals' existing knowledge regarding persuasion, agents, and topics will affect how they perceive and interpret persuasion attempts. Following this, user existing knowledge focuses on users' beliefs concerning persuasion, agents, and topics, rather than actual knowledge. On the contrary, perceived persuasion is a situational factor triggered by current persuasion attempts, aligning with persuasion knowledge activation, the term used by PKM studies (e.g., Wei et al. 2008; Williams et al. 2004). Based on PKM, individuals will be less likely to adopt persuasion knowledge when their agent and/or topic knowledge are high. In line with this, I expect that users with high agent and topic knowledge will perceive less perceived persuasion and high perceived assistance than those with low agent and topic knowledge. Also, I argue that those with high general persuasion knowledge have more resources to interpret persuasion attempts than those with low persuasion knowledge, thus increasing perceived persuasion and decreasing perceived assistance. Thus, I hypothesize:

H27a: Users' agent will dampen their perceived persuasion.

H27b: Users' topic knowledge will dampen their perceived persuasion

H27c: Users' persuasion knowledge will enhance perceived persuasion.

H28a: Users' agent knowledge will increase their perceived assistance.

H28b: Users' topic knowledge will increase their perceived assistance.

H28c: Users' persuasion knowledge will decrease perceived assistance.

I summarize all hypotheses in the proposed theoretical model in Appendix D Table 79.

3.4 Conclusion

An integrated theoretical model of persuasion awareness in online settings and hypotheses are proposed in this chapter. First, I review the relevant literature in multiple streams of research. Based on this review, I come up with a theory of persuasion awareness in this particular context. Drawing on PKM (Friestad and Wright 1994), I identify two persuasion awareness constructs—perceived persuasion beliefs and perceived assistance beliefs. The perceived persuasion beliefs construct underlies perceived persuasive intent and perceived agent benefits, whereas the perceived assistance reflects perceived assistive intent and perceived user benefits. Also, drawing on Campbell (1995), perceived user costs and perceived agent costs are added. These constructs will affect perceived appropriateness. Then, I explain how these constructs will influence users' behavioral responses, both cognitive and objective, which are the ultimate outcomes in the proposed model.

Additionally, according to DSS literature (Silver 2006), I specify a typology of PDF which serves as a technological determinant of persuasion in online settings. This results in two forms of PDFs, namely, suggestive and supportive. Also, taken DSS (Silver 2006) and Toulmin's model of argument (Toulmin 1958, 2003) together, I detail what and how the suggestive form can be

manifested, thereby leading to three sub-dimensions: content, mode, and invocation style. In the proposed model, these dimensions of PDFs will differently affect the persuasion awareness constructs. Finally, I employ PKM (Friestad and Wright 1994) and suggest applicable ways in which transparency mechanisms can be designed to strengthen users' persuasion awareness.

3.5   Theoretical and Practical Contributions

The theoretical contributions of my research are three-fold. First, building on the literature on DSS, I offer a PDF as a technological determinant of persuasion awareness. Unlike Silver (2006)'s DSS literature which focuses on the three different types of guidance—suggestive, quasi-suggestive, and information, I propose that the suggestive form is a continuum for PDFs. This continuum ranges from not suggestive to quasi-suggestive to suggestive. Also, I define an additional form of technology design, a supportive form which can facilitate persuasion and has an impact on users' interpretation of PDFs. Also, I detail the content of PDFs based on Toulmin's model of argument, which gives a better picture of PDFs (Toulmin 1958, 2003).

Secondly, I systematically add perceived personalization to persuasion awareness theories. With the increasing potential of technologies in understanding users' preferences, I expect that perceived personalization will play a critical role and affect users' persuasion awareness. Specifically, perceived personalization will affect perceived assistance, perceived agent costs, and perceived user costs.

Finally, my research casts light on how users perceive PDFs and suggests possible transparency mechanisms which enhance the users' perceived persuasion and assistance. Perceived persuasion and assistance will then shape the users' informed evaluations and decisions. A comprehensive theoretical model I propose systematically explains this phenomenon.

Additionally, from a practical viewpoint, the results of my research will provide a useful guideline to develop an online platform that facilitates users being better informed about a persuasion attempt generated by the platform. I expect that my proposed model will explain persuasion awareness in various online settings, such as e-commerce websites, social networking sites, online applications. As Facebook has developed and tested its transparency tool to increase users' persuasion awareness (Dua 2017), my theoretical model will help inform such tool design. Thus, this study serves as an initial step toward the understanding of persuasion awareness in online settings.

3.6   Future Research

While Toulmin (1958, 2003) helps define the possible content elements of the suggestive form, speech act theory gives meaning (Searle 1979). Speech act theory argues that "speaking a language is performing speech acts, acts such as making statements, giving commands, asking questions, making promises, and so on" (Searle 1969, p. 16). Based on the five purposes of speaking, Searle (1979) proposes five general ways of using language or speech acts: 1) assertive—"we tell people how things are," 2) directive—"we try to get them to do things," 3) commissive—"we commit ourselves to do things," 4) expressive—"we express our feelings and attitudes," and 5) declaration—"we bring about changes in the world through our utterances" (p. viii). Taking these definitions with Toulmin's argument elements, I argue that 1) assertive can be applied to claim-conclusion, data, backing, warrant, and rebuttal, 2) directive is able to address the action and the recommendation element, 3) and expressive is applicable to the standpoint element. Speech act theory has been used to develop IT systems, such as recommendation agents (RAs). For instance, Al-Natour et al. (2006) manipulated the dominant personality of RAs based on suggestive

guidance and directive speech acts. They found that individuals with dominant personality perceived high similarity between RAs and themselves when RAs exhibited high suggestive and used directives, while those with submissive characteristics perceived high similarity between themselves and RAs with less suggestive and assertive. This study points out that speech acts can be embedded in IT, such as RAs. Thus, speech acts are applicable to design content elements of the suggestive and quasi-suggestive PDF. In this case, future research may interest in combining different speech acts to the propose model.

In addition, the proposed theoretical model focuses only the suggestive form of PDF that features content. However, non-observable cues, such as product placement and order (Miller and Campbell 1959), and subliminal cues, such as a brand logo flashing on the background (Mandel and Johnson 2002), can enable persuasion. These cues will be less likely to trigger users' perceived persuasion. Thus, persuasion transparency information that explains how the cues work will increase their perceived persuasion even further. Thus, future research should incorporate these cues and propose their impact on users' persuasion awareness.

Next, I examine some hypotheses proposed in the model in the two empirical studies. The first empirical study (empirical study 1) will explore the effect of the suggestive form, specifically claim, data, and their combinations, on users' persuasion awareness and behavioral responses in the context of e-commerce settings (Chapter 4). The second empirical study (Chapter 5) investigates the role of persuasion transparency information in enhancing users' persuasion awareness.

Chapter 4: Investigating the Effect of Suggestive Content on Online Users' Persuasion Awareness

4.1 Overview

This chapter sets out to empirically examine the notion that a persuasive design feature (PDF), specifically, suggestive content, will influence users' perceptions (perceived persuasion, perceived assistance, perceived user costs, and perceived agent costs) and behavioral responses (objective and cognitive). Specifically, I investigate the following hypotheses described in detail in 3.3 in Chapter 3:

H1: Perceived persuasion of online entities will decrease perceived appropriateness of online entities that provide PDFs.

H2: Perceived assistance of online entities will increase perceived appropriateness of online entities that provide PDFs

H3: Perceived user costs will decrease perceived appropriateness of online entities that provide PDFs.

H4: Perceived agent costs will increase perceived appropriateness of online entities that provide PDFs.

H5: Perceived appropriateness of online entities that provide PDFs will increase users' positively cognitive-behavioral responses.

H6: Perceived persuasion of online entities will increase users' objective-behavioral responses.

H7: Perceived assistance of online entities will promote users' objective-behavioral responses.

H8: Online entities that provide suggestive PDFs will increase users' perceived persuasion.

H10: Online entities that provide the suggestive form of PDFs will increase users' perceived assistance.

H12: Online entities that provide the suggestive form of PDFs will increase users' perceived personalization.

H13a: For the content of the suggestive form, online entities that provide the claim-only (C) PDFs will enhance users' perceived persuasion of such entities more than those that provide the data-only (D) PDFs.

H13b: Online entities that add content(s) to a claim PDF (C + D) will not increase users' perceived persuasion of such entities.

H14a: Online entities that add data only (C + D) to the claim content will strengthen users' perceived assistance of such entities more than those that provide PDFs with claim-only (C) and data-only (D) content.

H16: Perceived personalization will enhance perceived assistance.

H17: Perceived personalization will increase perceived agent costs.

I test the above predictions in two online experiments (experiment 1 and 2) in the context of e-commerce. Figure 6 depicts the research model tested in this chapter. Prior to the two experiments, I conducted a series of pretests using online experiments. See Appendix E E.3, E.4, and E.5. These pretests provide preliminary evidence that suggestive content which induces different levels of suggestive design leads to perceived persuasion but does not influence perceived assistance. In

experiment 1, I assess five suggestive content conditions, plus one control condition. These include two claim-only (C) conditions ("Buy this item" and "We recommend this"), two data-only (D) conditions ("Best-selling item" and "Low in stock"), and one claim-and-data (C & D) condition ("Best-selling item. We recommend this."). However, the C & D condition might be perceived as two different suggestive pieces, rather than one piece featuring a claim with data as a support. Therefore, I add one data-supporting-claim (D → C) condition ("Since this is best-selling, we recommend this.") to experiment 2.

Pooled together, experiments 1 and 2 replicate the effect of suggestive content on perceived persuasion. Specifically, providing users with claim or data content makes them more aware of persuasion. However, adding data to a claim (C & D) or supporting a claim with data (D → C) does not increase perceived persuasion. Also, these two experiments offer evidence that only data content influences perceived assistance through perceived personalization (mediator). In other words, an online entity featuring data content influences perceived personalization which, in turn, leads to perceived assistance. Nevertheless, users do not perceive an online entity with C or C & D as assistive. Only when D → C is provided, the entity is viewed as assistive. Also, the experiments reveal that only data content stimulates perceived agent costs. This observed effect arises from perceived personalization. That is, an online entity featuring data content leads to higher perceived personalization that results in perceived agent costs.

In addition, the two experiments provide structural path evidence that perceived persuasion negatively influences perceived appropriateness, while perceived assistance and perceived agent costs positively and strongly lead to higher perceived appropriateness. To be specific, when users perceive that an online entity is trying to persuade them, they feel it to be less appropriate. In

contrast, those who feel that it attempts to assist them or puts in more effort in its design perceive it more appropriate. However, perceived user costs do not contribute to perceived appropriateness. In turn, perceived appropriateness contributes to cognitive-behavioral responses, such as reactance, attitudes towards the online entity, and intention to use it. That is, when users feel that the online entity is appropriately designed, they have lower reactance, have positive attitudes towards it, and will be more likely to interact with it in the future. Finally, perceived persuasion positively impacts objective-behavioral responses, such as targeted product selection and consideration. In contrast, perceived assistance does not affect those responses. Particularly, when users are aware of persuasion, they engage in the targeted product more. Consistent with PKM, perceived persuasion leads users to evaluate the targeted product more carefully.

In conclusion, providing a claim with data support (D → C) is a better design than providing a claim-only (C), data-only (D), or claim-and-data (C & D). This results from the fact that D → C does not make users more aware of persuasion but makes them perceive more assistance of an online agent. Although adding data as a support does not increase users' perceived persuasion, it influences perceived persuasion, thereby leading to a more careful evaluation. Thus, these experiments serve as a stepping-stone to better understanding antecedents and consequences of persuasion awareness in online settings. In the next chapter, I design transparency mechanisms to increase user awareness of persuasion and explain how they work. This will lead to more careful evaluation and thus promote informed evaluation and decision-making.
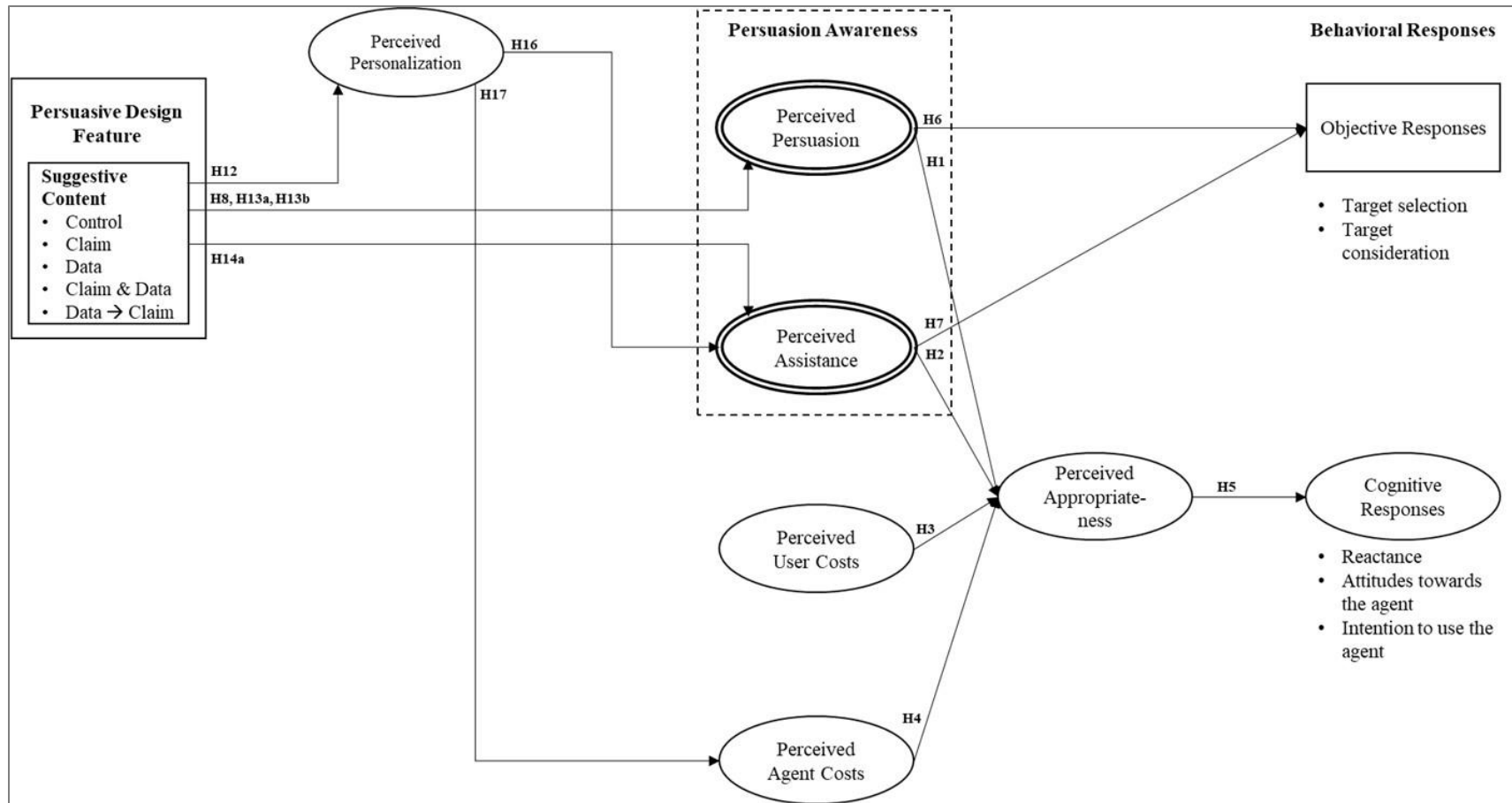
Note: Rectangles – observable constructs; ellipses – non-observable constructs; double-lined ellipses – higher-order constructs; the perceived persuasion beliefs high-order construct underlines perceived persuasive intent and perceived agent benefits; the perceived assistance beliefs higher-order construct underlines perceived assistive intent and perceived user benefits

Figure 6. Research model tested in empirical study 1

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4.2   Research Method

I conducted two online experiments. In Experiment 1, a 6 (suggestive content) between-subjects design was utilized. In experiment 2, I added one more condition that evaluated whether or not the "Best-selling item. We recommend this." content was perceived as two suggestive elements instead of one. Accordingly, the "Since this is best-selling, we recommend this." was added to experiment 2. See manipulations of suggestive content in Table 11.

Suggestive Content		Manipulation	Real-World Example	Condition	
Claim	Data			Experiment 1	Experiment 2
No	No	No manipulation	N/A	1	1
Yes	No	Buy this item	Watch now (Apple TV) Buy this (Children's wear website, Pöyry et al. 2017)	2	2
Yes	No	We recommend this	We suggest [movie name] (Netflix)	3	3
No	Yes	Best-selling item	Best seller (Amazon.com)	4	4
No	Yes	Low in stock	Only 5 rooms like this left on our site (Booking.com)	5	5
Yes	Yes	Best-selling item. We recommend this.	Great value today In high demand – only 5 rooms left (Booking.com)	6	6

Suggestive Content		Manipulation	Real-World Example	Condition	
Claim	Data			Experiment 1	Experiment 2
Yes	Yes	Since this is best-selling, we recommend this.	Since you follow [following name], you might like [name]. (Instagram)	N/A	7

Table 11. Suggestive content PDF manipulations in empirical study 1's main experiments

4.2.1 Experimental Website Design

An experimental website, called Home Appliance Group (homeappliancegroup.com), offered 40 digital bathroom scales, each with 9 product attributes (see Table 86 in E.1). Prior research used the number in the range of 50 alternatives to reflect moderate task complexity (54 alternatives, Kamis et al. 2008; 50 alternatives, Xu et al. 2014) and the 24 – 30 range for extensive options (Iyengar 1987). Also, extant literature utilized 5 – 9 product attributes to represent a moderate level of component complexity (6 attributes, Jiang and Benbasat 2007; 7+/-2, Miller 1956; 8 attributes, Xu et al. 2014). Moderate complexity is suitable for my study, as low complexity does not reflect real-world e-commerce websites and thus would limit the effect of suggestive content manipulation, while high complexity could cause a ceiling effect that would diminish the manipulation effect. However, there were 40 digital bathroom scales in the $15.00 – $100.00 price range available on Bestbuy.com on October 1, 2018. Accordingly, I chose 40 product alternatives with the nine important product attributes based on the results of the task product pretest to present a moderate level of task and component complexity. The website displays four products per row (4 products x 10 rows) on one screen.

In the control condition, there was no suggestive content and no targeted product. In contrast, in the treatment conditions, suggestive content was attached to a targeted product. For experiment 1, the suggestive content was assigned to the sixth product item in row 2 (second from the left), which was the targeted product. In the real world, the placement of suggestive content does not always appear in the top rows. The placement varies. For example, Amazon.com listed the hand sanitizer "best-seller" in row 8 out of 13 rows with four items per row. This placement could be a potential confound, as users will be more likely to view products on top more than those at the bottom of a page. Therefore, to control for the product placement effect, I randomly selected one out of 12 products in rows 2 (items 5 – 8), 5 (items 17 – 20), and 8 (items 29 – 32) as a targeted product for experiment 2. In this manner, all display regions were covered. An example screenshot of the "We recommend this" is presented in Figure 7.
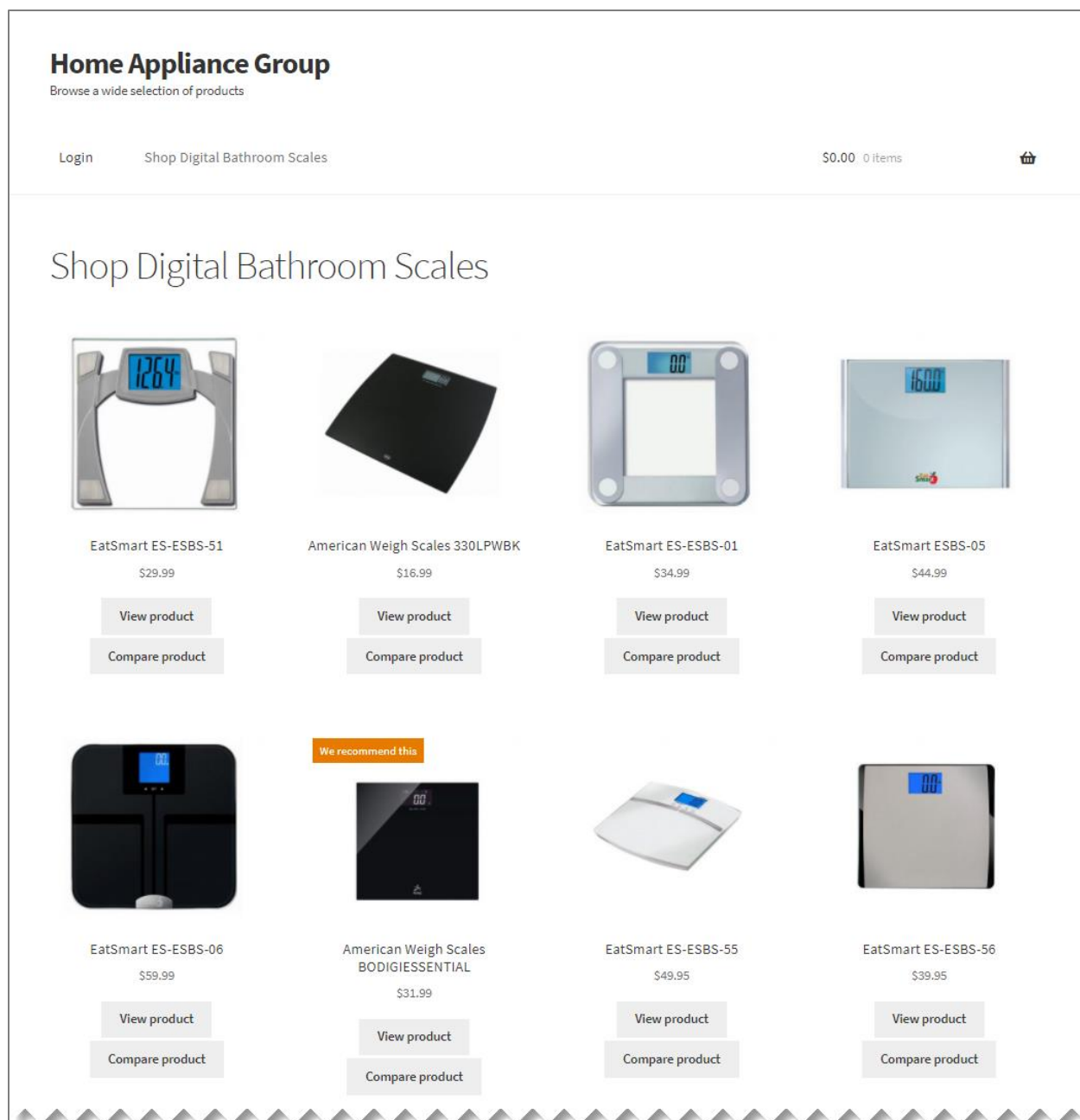
Figure 7. An example screenshot for the "We recommend this" condition

In all conditions, the website provides a comparison feature (consideration set) that allows

participants to compare products up to six items at a time by clicking "Compare product" and

"View product." I set the maximum number of products compared to 6, since existing literature

shows that consumers generally consider products (consideration set) in the range of 3 – 6 (Hauser

and Wernerfelt 1990). Thus, a compare feature that allows users to compare products up to six sufficiently reflects their consideration set size. Also, users could view product details/attribute values by clicking a "View product" button.

4.2.2 Experimental Procedures

According to the power analysis for between-subjects design with one covariate (effect size $f = 0.25$, $\alpha = 0.05$, $1 - \beta = 0.80$, numerator $df = 5$ for experiment 1 and 6 for experiment 2, number of groups = 6 for experiment 1 and 7 for experiment 2, number of covariates = 1 for perceived personalization) using G*Power program (Faul et al. 2007), the 211 and 225 participants were suggested for experiment 1 and 2, respectively, to assure sufficient statistical power of 0.80 for a medium effect size (Cohen 1988). To account for approximately 84% usable sample based on previous pretests, I recruited 251 and 281 participants from Prolific (www.prolific.co), an online participant recruitment platform for experiment 1 and 2, respectively. According to Palan and Schitter (2018), Prolific is a valuable platform for social and economic science research, since it provides transparency to participants that they are recruited to participate in research more than Amazon Mechanical Turk (MTurk) that has a wider range of usage, and offers better sufficient research-relevant functionality than other platforms. Participants were randomly assigned to access one of the six conditions in experiment 1 and one of the seven conditions in experiment 2.

Before the participants accessed the website in their assigned conditions, they were asked to complete a pre-questionnaire survey measuring their demographics (age, marital status, education, gender, and income) and their initial preference on each product attribute. Next, they were asked to read a scenario (see Appendix G Figure 71), website instructions and a tutorial (see Appendix H Figure 72). A tutorial describing how the website worked was provided. The tutorial used

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different products—wireless headphones—to avoid possible confounds. Next, they were asked to visit the website in their respective condition. Their task was to assess the website design and select one product they would seriously consider purchasing. Once they selected one product to check out, they were redirected to the post-questionnaire survey. This survey captured their perceptions regarding manipulation checks, perceived personalization, perceived assistance, perceived persuasion, perceived user costs, perceived agent costs, perceived appropriateness, reactance, attitudes towards the website, and intention to use the website. As control variables, e-commerce knowledge, persuasion knowledge, topic knowledge, perceived usefulness, perceived ease of use, online experiences, and purchasing experience were captured. Upon completion of the post-questionnaire survey, they received £2 each as a participation reward. To increase their involvement with the experiment, I paid a bonus of up to £1 to those who followed the instructions carefully, did the task seriously, and provided a serious, diligent response.

4.2.3   Measurement

I borrowed scales whenever possible and developed new ones based on definitions from the literature if existing scales were not available or applicable to my experimental context. Multiple items were employed to measure each construct. All scale items were randomly presented.

4.2.3.1   Manipulation Checks

I developed a scale to capture perceived claim content and data content according to the definition of claim and data from Toulmin (2003). Three items using a seven-point semantic differential scale for each were measured. Also, perceived informative design was developed based on the definition of informative decisional guidance from Silver (2006) to capture data content. Since data content

represents the factual data, it is in line with informative design that enlightens users. Three items using a seven-point semantic differential scale were adopted.

To identify specific contents in which the suggestive PDF can be carried out, I employ Toulmin's model of argumentation (Toulmin 1958, 2003). Specifically, I argue that claim content reflects the suggestive PDF, since it offers a conclusion, an action, a standpoint, or a recommendation that reveals a direction concerning what to do to users. Also, I expect that some data content (e.g., best-selling item) can provide meaningful information from which users can infer a direction regarding what to act. Thus, data content fits with the quasi-suggestive PDF. Perceived suggestive design was adapted from Al-Natour et al. (2006) and was measured by using the three items based on a seven-point semantic differential scale.

Table 12 presents the measurement items for perceived claim content, data content, informative design, and suggestive design.

Item Name	Item	Scale/Source
Please evaluate [agent name] in the following aspects:		Seven-point semantic differential scale
Perceived claim content		
Claim1	... did not state a conclusion put forward for acceptance. – … stated a conclusion put forward for acceptance.	Newly developed
Claim2	... did not make an assertion. – ... made an assertion.	Newly developed
Claim3_R	... made a claim. – ... did not make a claim. (R)	Newly developed
Perceived data content		
Data1	... did not give the factual data. – ... gave the factual data.	Newly developed
Data2	... did not provide an evidence. – ... provided an evidence.	Newly developed

Item Name	Item	Scale/Source
Data3_R	... offered supporting information. – ... did not offer supporting information. (R)	Newly developed
Perceived informative design		
Info1	... did not provide useful information. – ... provided useful information.	Newly developed
Info2	... was uninformative. – ... was informative.	Newly developed
Info3_R	... provided relevant information. – ... did not provide relevant information. (R)	Newly developed
Perceived suggestive design		
Suggest1	... did not make a recommendation. – ... made an explicit recommendation.	Al-Natour et al. (2006) (p. 853)
Suggest2	... did not provide a suggestion in terms of what option to select. – ... provided an explicit suggestion in terms of what option to select.	Al-Natour et al. (2006) (p. 853)
Suggest3_R	... explicitly suggested a specific course of action. – ... did not suggest a specific course of action. (R)	Al-Natour et al. (2006) (p. 853)

Note: R = reversed item

Table 12. Measurement for manipulation checks in empirical study 1

4.2.3.2 Perceived Personalization

I borrowed the perceived personalization scale from Komiak and Benbasat (2006) using a seven-point semantic differential scale. See Table 13 for measurement items.

Item Name	Item	Scale/Source
To what extent do you agree or disagree with the following statements with respect to [agent name]:		1 = strongly disagree to 7 = strongly agree
Perceived personalization		
Person1	... understood my needs.	Komiak and Benbasat (2006)

Item Name	Item	Scale/Source
Person2	... took my needs as its own preferences.	Komiak and Benbasat (2006)
Person3_R	... did not know what I want. (R)	Komiak and Benbasat (2006)

Note: R = reversed item

Table 13. Measurement for perceived personalization in empirical study 1

4.2.3.3   Perceived Persuasion Beliefs

According to the measurement pretest, perceived persuasive intent and perceived agent benefits load onto the same construct, perceived persuasion beliefs. Despite their correlations, the two are distinct concepts. In other words, perceived persuasive intent focuses on the process of persuasion, whereas perceived agent benefits emphasize the perceived outcome of persuasion. For instance, an online entity that is trying to persuade you to fulfill its goal might not end up with its perceived benefits as outcomes.   Accordingly, I conceptualize a higher-order reflective construct of perceived persuasion underlying: 1) perceived persuasive intent and 2) perceived agent benefits. For perceived persuasive intent, I borrowed two items of directives from Al-Natour et al. (2006) and developed one reversed item to capture this dimension using a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree).

In addition, perceived agent benefits tap on perceived persuasion (Campbell 1995). I added perceived agent benefits that focus on sales benefits as another dimension. One item was borrowed from Williams et al. (2004). Two items were developed. These items were measured based on a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree).

Table 14 shows measurement items for perceived persuasive intent and agent benefits.

Item Name	Item	Scale/Source
To what extent do you agree or disagree with the following statements with respect to [agent name]:		1 = strongly disagree to 7 = strongly agree
Perceived persuasive intent		
Persuasive1	... tried to make me act in a certain way.	Al-Natour et al. (2006)
Persuasive2	... tried to direct my decision.	Al-Natour et al. (2006)
Persuasive3_R	... did not try to influence me to perform a certain action. (R)	Newly developed
Perceived agent (website) benefits		
WBenefit_S1	... had a direct profit motive.	Williams et al. (2004)
WBenefit_S2	... tried to make a sale of a certain product.	Newly developed
WBenefit_S3_R	I do not think the goal of ... was to sell a specific product. (R)	Newly developed

Note: R = reversed item

Table 14. Measurement for perceived persuasion (perceived persuasive intent and agent benefits) in empirical study 1

4.2.3.4 Perceived Assistance Beliefs

Like perceived persuasion, the perceived assistance beliefs construct is conceptualized as a higher-order reflective construct that underlies perceived assistive intent and perceived user benefits. Analogously, despite their correlation, they are different. Perceived assistive intent highlights the process of assistance of an online entity. On the contrary, perceived user benefits are the perceived outcomes. If users feel that an online entity attempts to assist them, they will not end up with the perception that they benefit from this attempt. To capture perceived assistive intent, I developed three items using a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree).

Additionally, perceived user benefits from Campbell (1995) align with perceived assistance, as it focuses on informational benefits that would help users' decision-making. As a result, I added perceived user benefits as another aspect. The three scale items for perceived user benefits were adapted from Campbell (1995), measured based on a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree).

Measurement items for both constructs appear in Table 15.

Item Name	Item	Scale/Source
	To what extent do you agree or disagree with the following statements with respect to [agent name]:	1 = strongly disagree to 7 = strongly agree
Perceived assistive intent		
Assist1	I feel ... was trying to help me.	Newly developed
Assist2	I perceive ... was trying to assist me.	Newly developed
Assist3_R	I do not feel ... attempted to help me. (R)	Newly developed
Perceived user benefits		
UBenefit1	I feel I benefited from interacting with	Campbell (1995)
UBenefit2	I perceive I got benefits from interacting with	Campbell (1995)
UBenefit3_R	I did not get any information from interacting with ... . (R)	Campbell (1995)

Note: R = reversed item

Table 15. Measurement for perceived assistance (perceived assistive intent and perceived user benefits) in empirical study 1

4.2.3.5 Perceived User Costs

In this experiment, users' effort exerted in interacting with the website reflects user costs. Thus, the scale for perceived user effort was adapted from Tsekouras et al. (Working Paper) using a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree). Table 16 presents the measurement items.

Item Name	Item	Scale/Source
To what extent do you agree or disagree with the following statements with respect to [agent name]:		1 = strongly disagree to 7 = strongly agree
Perceived user costs		
UCost_E1	I put a lot of effort into interacting with	Tsekouras et al. (Working Paper)
UCost_E2	I worked hard interacting with	Tsekouras et al. (Working Paper)
UCost_E3_R	I did not exert a lot of effort into interacting with ... . (R)	Tsekouras et al. (Working Paper)

Note: R = reversed item

Table 16. Measurement for perceived user costs in empirical study 1

4.2.3.6   Perceived Agent Costs

Agent costs include money, time, or effort an agent takes to deliver a PDF (Campbell 1995). I focus on effort and time an online entity exerts in its design, rather than money that would be less transparent to users. Three items using a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree) were adapted from Campbell (1995). See Table 17 for the measurement items.

Item Name	Item	Scale/Source
To what extent do you agree or disagree with the following statements with respect to [agent name]:		1 = strongly disagree to 7 = strongly agree
Perceived agent costs		
WCost1	... seems to have put more effort into its design features.	Campbell (1995)
WCost2	... seems to have put a lot of time into its design features.	Campbell (1995)
WCost3_R	... did not show a lot of thought and care in its design features. (R)	Campbell (1995)

Note: R = reversed item

Table 17. Measurement for perceived agent costs in empirical study 1

4.2.3.7   Perceived Appropriateness

The perceived appropriateness scale was borrowed from Campbell (1995) and measured based on a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree). Table 18 shows the three items.

Item Name	Item	Scale/Source
To what extent do you agree or disagree with the following statements with respect to [agent name]:		1 = strongly disagree to 7 = strongly agree
Perceived appropriateness		
Appropriate1	The way ... designed its design features seems acceptable to me.	Campbell (1995)
Appropriate2	I think that the design features of ... are appropriate.	Campbell (1995)
Appropriate3_R	The design features of ... are not fair in what were shown. (R)	Campbell (1995)

Note: R = reversed item

Table 18. Measurement for perceived appropriateness in empirical study 1

4.2.3.8   Reactance

According to Dillard and Shen (2005), there are two dimensions of reactance—negative cognition and anger. This study focuses on the anger dimension. For the anger dimension, four items using the seven-point response scale anchoring at 1 = none and 7 = a great deal were borrowed from Dillard and Shen (2005). See Table 19 for detail.

Item Name	Item	Scale/Source
Answer the following questions with respect to [agent name]:		1 = none to 7 = a great deal
Anger		
Anger1	Did you feel angry while interacting with … ?	Dillard and Shen (2005)

Item Name	Item	Scale/Source
Anger2	Did you feel annoyed while interacting with … ?	Dillard and Shen (2005)
Anger3	Did you feel irritated while interacting with … ?	Dillard and Shen (2005)
Anger4	Did you feel aggravated while interacting with … ?	Dillard and Shen (2005)

Note: R = reversed item

Table 19. Measurement for reactance in empirical study 1

4.2.3.9 Attitudes towards an Agent (Website)

Participants were asked to rate the design of the website in the following aspects using a seven-point semantic differential scale. Table 20 presents the three items.

Item Name	Item	Scale/Source
To what extent did you feel the design of [agent name] was:		Seven-point semantic differential scale
Attitudes towards an agent (website)		
Att1	Bad – Good	Newly developed
Att2	Unfavorable – Favorable	Newly developed
Att3_R	Likable – Dislikable (R)	Newly developed

Note: R = reversed item

Table 20. Measurement for attitudes towards an agent in empirical study 1

4.2.3.10 Intention to Use an Agent (Website)

Three items were borrowed from Pavlou and Fygenson (2006) and measured based on a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree). See Table 21 for detail.

Item Name	Item	Scale/Source
To what extent do you agree or disagree with the following statements with respect to [agent name]:		1 = strongly disagree to 7 = strongly agree
Intention to use an agent (website)		
Inten1	I intend to use ... in the future.	Pavlou and Fygenson (2006)
Inten2	I predict I would use ... in the future.	Pavlou and Fygenson (2006)
Inten3_R	I do not plan to use ... in the future. (R)	Pavlou and Fygenson (2006)

Note: R = reversed item

Table 21. Measurement for intention to use an agent in empirical study 1

4.2.3.11 Control Variables

According to PKM (Friestad and Wright 1994), three types of knowledge that individuals possess can influence how they interpret persuasion attempts. Thus, agent, topic, and persuasion knowledge were measured based on a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree). As my experimental website was fictitious and new to participants, e-commerce knowledge was measured instead. Three items were adapted from Al-Natour et al. (2011). For topic knowledge, participants' knowledge regarding the product was captured. The three items were borrowed from Al-Natour et al. (2011). I adapted three items of persuasion knowledge from Bearden et al. (2001). Also, to differentiate perceived assistance from perceived usefulness, and perceived user costs from perceived ease of use, perceived usefulness and perceived ease of user were measured. The scales were borrowed from Davis et al. (1989). Table 22 presents the items capturing these control variables.

Item Name	Item	Scale/Source
To what extent do you agree or disagree with the following statements:		1 = strongly disagree to 7 = strongly agree
Perceived agent (e-commerce) knowledge		
AgentKnow1	I have extensive experience with e-commerce websites.	Al-Natour et al. (2011)
AgentKnow2	I consider myself to be an expert in e-commerce websites.	Al-Natour et al. (2011)
AgentKnow3_R	I have no idea about e-commerce websites. (R)	Al-Natour et al. (2011)
Perceived topic knowledge		
TopicKnow1	I consider myself to be an expert in bathroom scales.	Al-Natour et al. (2011)
TopicKnow2	I am knowledgeable about bathroom scales.	Al-Natour et al. (2011)
TopicKnow3_R	I have limited experience in bathroom scales. (R)	Al-Natour et al. (2011)
Perceived persuasion knowledge		
PerKnow1	I know when an offer is too good to be true.	Bearden et al. (2001)
PerKnow2	I know when a marketer is pressuring me to buy.	Bearden et al. (2001)
PerKnow3_R	I cannot see through sales gimmick used to get consumers to buy. (R)	Bearden et al. (2001)
Perceived usefulness		
Useful1	Using the website enabled me to accomplish my shopping task more quickly.	Davis et al. (1989)
Useful2	Using the website made it easier to do my shopping task.	Davis et al. (1989)
Useful3_R	I found the website not useful in my shopping task.	Davis et al. (1989)
Perceived ease-of-use		

Item Name	Item	Scale/Source
Ease1	I found it easy to get the website to do what I wanted it to do.	Davis et al. (1989)
Ease2	I found the website to be flexible to interact with.	Davis et al. (1989)
Ease3_R	I found the website not easy to use.	Davis et al. (1989)

Note: R = reversed item

Table 22. Measurement for control variables in empirical study 1

The complete detail of the pre- and post-questionnaire survey is presented in Appendix I Table 140.

4.2.3.12   Objective Measures

In addition to the scale measures, objective measures were adopted to capture participants' targeted product consideration (targeted product compared or targeted product viewed), the number of products consideration (the number of products compared and the number of products viewed), and target product selection. Product consideration measures were from Google Analytics (GA) that tracked all events each participant performed when interacting with the website. Product consideration was captured by adding a product to compare using a comparison feature or clicking a "View product" to see product detail. When participants added a specific product to the shopping cart, their final product choice was recorded. For the treatment conditions, if the selected product was their assigned target, their targeted selection was recorded as "yes." Otherwise, "no" was recorded for their targeted selection.

4.3   Data Analyses

4.3.1   Participant Background Information

The 532 participants were recruited from Prolific ($N_{Experiment1}$ = 251, $N_{Experiment2}$ = 281). Two participants who did not finish the post-questionnaire survey and 13 participants who did not use a correct username (unable to track their pre-questionnaire survey) were removed from the study. Also, those who used a mobile device, added more than one product to a cart, spent less than 60 seconds on the website, and/or failed the attention check questions were excluded from analyses, resulting in 464 usable participants from the two experiments ($N_{Experiment1}$ = 224, $N_{Experiment2}$ = 240). Additional data from Google Analytics (GA) was used to evaluate objective responses such as targeted product consideration. GA data was available for those who used non-private (non-incognito) browsing mode only. There were 355 participants with usable GA data ($N_{Experiment1}$ = 177, $N_{Experiment2}$ = 178). Chi-square tests were performed to assess a difference in the GA-tracked and no-GA-tracked proportion across all seven experimental conditions. No significant differences were found. See Table 139 in Appendix F for details regarding the participants.

Further analyses revealed that there was no significant difference in age, education, or gender, and a significant difference in income across the seven conditions. Chi-square tests were conducted to assess the differences among these conditions. See Table 23. However, these had cells having an expected count of less than 5. Thus, the interpretation of results should take this into account. Although there was a significant association between the condition and income, the association strength was relatively weak, Cramer's V = .15. Also, it did not influence any constructs. Thus, it was excluded from further analyses.

Measure	χ^2	df	p
Age	46.12[a]	36	.12
Marital status	19.67[a]	24	.72
Education	43.64[a]	42	.40
Gender	21.45[a]	30	.87
Income	58.24[a]	42	.05

Note: [a] Expected count less than 5

Table 23. Chi-square tests comparing the seven conditions in terms of demographics in empirical study 1

Moreover, there was no significant difference in online search frequency, online shopping frequency, or past purchase of a bathroom scale among the seven conditions. See Table 24. Therefore, participants across all seven conditions did not differ in terms of online search, shopping experience, or past bathroom scale purchase experience.

Measure	χ^2	df	p
Search frequency	35.17[a]	48	.92
Online shopping frequency	48.16[b]	48	.47
Past bathroom scale purchase	6.73	6	.35

Note: [a] 50 cells (79.40%) have expected count less than 5, [b] 26 cells (41.30%) have expected count less than 5

Table 24. Chi-square tests comparing the seven conditions in terms of user experiences in empirical study 1

4.3.2 Results on Control Variables

Table 25 presents one-way ANOVA results in the control variables. First, a one-way ANOVA was conducted to evaluate the difference in three types of knowledge across the seven conditions. Results revealed that there was no significant difference in e-commerce knowledge (agent knowledge) with a small effect size, a marginally significant difference in persuasion knowledge with a small effect size, and a marginally significant difference in product knowledge (topic

knowledge) with a small effect size. However, follow-up tests using a Bonferroni correction did not show any difference in persuasion and product knowledge among the seven conditions, $p >$ .05.

Secondly, other objective behaviors were analyzed. A one-way ANOVA revealed that there was no significant difference in the number of products compared with a small effect size, the number of products viewed with a small effect size, or time spent on the website task with a trivial effect size across all conditions. Also, a Chi-square test on page scroll depth percentage was applied. Results showed that no significant difference in the page scroll depth percentage was found, $\chi^2(12)$ = 6.96, p = .86[1]. 89% of participants with GA track scrolled 100% and about 11% scrolled about 75% of the page. This implied that a targeted product in rows 2, 5, and 8 was discovered by all participants.

Thirdly, I assessed the difference in perceived usefulness and ease of use across all conditions. Results from a one-way ANOVA indicated that there was no significant difference in perceived usefulness with a small effect size and no significant difference in perceived ease of use with a small effect size across the seven conditions.

Measure	$F(6, 457)$	p	η_p^2
User knowledge			
Agent (e-commerce) knowledge	1.13	.34	.02
Persuasion knowledge	1.85	.09	.02
Topic (product) knowledge	1.92	.08	.03
Objective behaviors			
Number of products compared	0.74[a]	.62	.01

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[1] 8 cells (38.1%) have expected count less than 5.

Measure	$F(6, 457)$	p	η_p^2
Number of products viewed	0.38[a]	.89	.01
Time spent on the website task	0.15	.99	.00
Others			
Perceived usefulness	1.23	.27	.02
Perceived ease of use	1.60	.15	.02

Note: [a] $F(6, 355)$ – GA-tracked participants only

Table 25. One-way ANOVAs in control variables in empirical study 1

Next, I emphasized the effect of the suggestive content—claim, data, and their interaction—on persuasion awareness, behavioral responses, and associated outcome variables in this chapter. Appendix J reports the differences in these variables among the seven experimental conditions.

4.3.3 Manipulation Checks

4.3.3.1 Perceived Claim Content

Cronbach's alpha of the Perceived Claim Content scale was 0.70 after a reversed item (Claim3) was dropped, indicating sufficient internal consistency reliability. A two-way ANOVA with claim and data content was conducted. The means and standard deviations are presented in Table 26. Table 27 shows the statistics. Results showed a significant effect of the claim manipulation with a small effect size, a significant effect of the data manipulation with a small effect size, and a significant interaction between claim and data content with a small effect size. Specifically, a website with claim content led to significantly higher perceived claim content than a website without claim content. Also, a website with data content induced a significantly higher degree of perceived claim content than a website without data content. Follow-up tests using a Bonferroni correction were performed. Results revealed that in the presence of claim content, data content led to higher perceived claim content than no data content, $p < .001$. However, in the absence of claim

content, no significant difference between data and no data was found, $p = 1.00$. That is, a claim

with data (C & D and D → C) content aroused higher perceived claim content than a claim without

data content (C). Consistent with Toulmin (2003), an argument requires at least two elements,

claim and data. Thus, a claim-only content is less likely to be considered as a claim than a claim

with data content. Also, there was no difference in perceived claim content between the control

(no claim – no data) and the data-only (D) condition. Therefore, the manipulation of claim content

was successful. Figure 8 shows the difference in perceived claim content between the claim and

the data manipulation.

Suggestive Content PDF		Mean	Standard Deviation
Claim	**Data**		
No claim	No data	3.38	1.58
	Data	3.38	1.63
	Total	3.38	1.61
Claim	No data	3.63	1.70
	Data	4.47	1.32
	Total	3.97	1.61
Total	No data	3.55	1.66
	Data	3.82	1.61
	Total	3.69	1.64

Table 26. Means and standard deviations of perceived claim content grouped by the claim and the data condition in empirical study 1

Effect	$F(1, 460)$	p	η_p^2
Claim	18.86	.00	.04
Data	7.51	.01	.02
Claim x data	7.46	.01	.02

Table 27. Two-way ANOVA in perceived claim content in empirical study 1
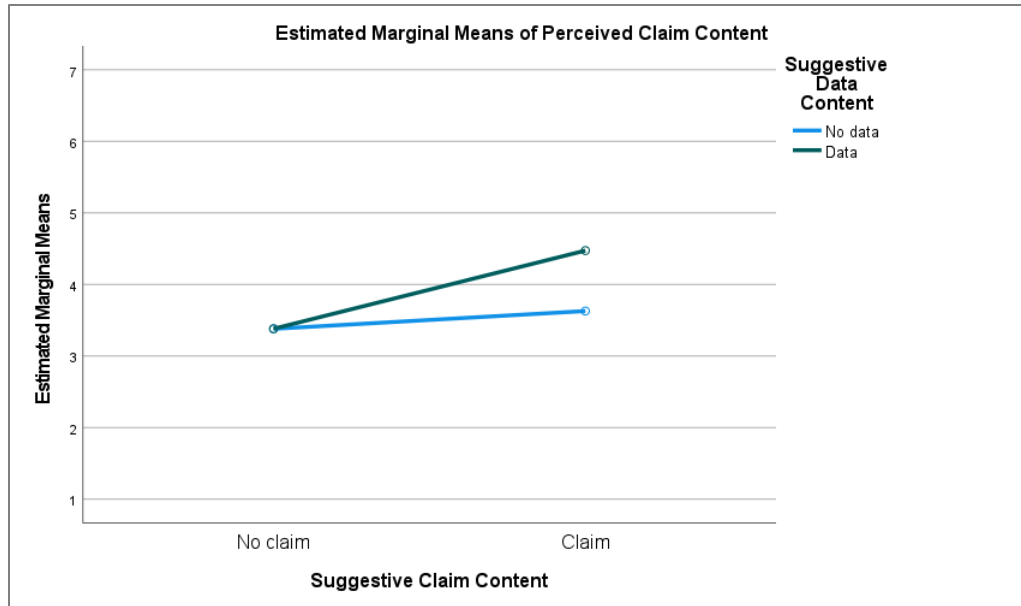
Figure 8. The difference in perceived claim content between the claim and the data condition in empirical study 1

4.3.3.2 Perceived Data Content

The Cronbach's alpha for the Perceived Data Content scale was 0.46, indicating insufficient internal consistency reliability. Accordingly, a two-way ANOVA with claim and data content was conducted on each perceived data content item. Table 28 reports the means and standard deviations. Table 29 shows the ANOVA results. Results demonstrated that there were no significant effects of claim or data manipulation, and no claim x data interaction, for all three items. Thus, those in the claim and data manipulation did not significantly perceive the difference in each perceived data content scale. However, as this scale was newly developed, it might not sufficiently capture perceived data content.

Suggestive Content PDF		Mean	Standard Deviation
Claim	**Data**		
Data1			
No claim	No data	5.92	1.43

Suggestive Content PDF		Mean	Standard Deviation
Claim	**Data**		
	Data	6.04	1.22
	Total	6.00	1.29
Claim	No data	6.13	1.26
	Data	6.02	1.31
	Total	6.09	1.28
Total	No data	6.06	1.32
	Data	6.03	1.26
	Total	6.05	1.28
Data2			
No claim	No data	4.45	1.71
	Data	4.37	1.79
	Total	4.40	1.76
Claim	No data	4.36	1.75
	Data	4.44	1.74
	Total	4.39	1.74
Total	No data	4.39	1.73
	Data	4.40	1.77
	Total	4.39	1.75
Data3 (recoded Data3_R, a reversed item)			
No claim	No data	5.13	1.70
	Data	5.14	1.82
	Total	5.14	1.77
Claim	No data	5.07	1.79
	Data	5.23	1.73
	Total	5.13	1.76
Total	No data	5.09	1.76
	Data	5.18	1.78

Suggestive Content PDF		Mean	Standard Deviation
Claim	**Data**		
	Total	5.14	1.77

Table 28. Means and standard deviations of perceived data content (3 items) grouped by the claim and the data condition in empirical study 1

Effect	$F(1, 460)$	p	η_p^2
Data1			
Claim	0.60	.44	.00
Data	0.00	.95	.00
Claim x data	0.88	.35	.00
Data2			
Claim	0.01	.95	.00
Data	0.00	1.00	.00
Claim x data	0.21	.65	.00
Data3			
Claim	0.01	.92	.00
Data	0.28	.60	.00
Claim x data	0.19	.66	.00

Table 29. Two-way ANOVA in perceived data content (3 items) in empirical study 1

4.3.3.3 Perceived Informative Design

In addition to perceived data content, perceived informative design was used to assess the data content manipulation success. The Cronbach's alpha for the Perceived Informative Design scale was 0.75 after a reversed item (Info3) was removed, indicating sufficient internal consistency reliability. A two-way ANOVA with claim and data content was conducted. Table 30 reports the means and standard deviations. The statistics are presented in Table 31. Results indicated that there was no significant effect of the claim manipulation with a small effect size, no significant effect of the data manipulation with a small effect size, and no significant interaction between claim and

data content with a trivial effect size. In other words, claim and data content did not differ in terms of informative design. Hence, the manipulation of data content was not successful. The difference in perceived informative design between the claim and the data manipulation is shown in Figure 9.

Suggestive Content PDF			Mean	Standard Deviation
Claim	**Data**			
No claim	No data		5.68	1.35
	Data		6.00	1.32
	Total		5.90	1.34
Claim	No data		6.02	1.05
	Data		6.05	1.10
	Total		6.03	1.07
Total	No data		5.91	1.17
	Data		6.02	1.24
	Total		5.97	1.20

Table 30. Means and standard deviations of perceived informative design in the claim and the data condition in empirical study 1

Effect	$F(1, 460)$	p	η_p^2
Claim	2.76	.10	.01
Data	2.21	.14	.01
Claim x data	1.43	.23	.00

Table 31. Two-way ANOVA in perceived informative design in empirical study 1
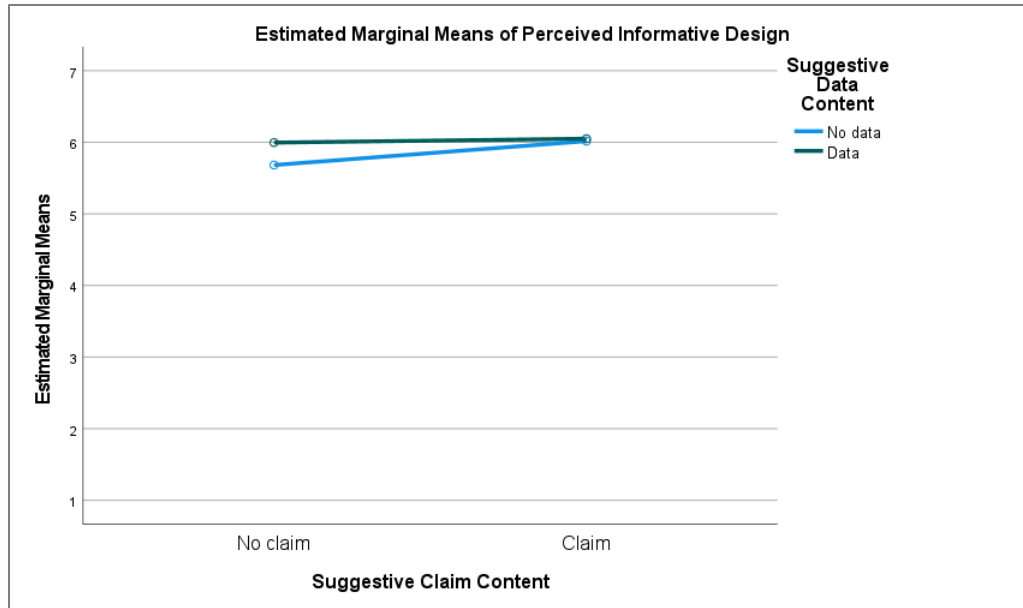
Figure 9. The difference in perceived informative design between the claim and the data condition in empirical study 1

Although no significant difference between claim and data content condition was found, results from a one-way ANOVA comparing the treatments with the control condition revealed that a significant effect of the condition was found, $F(1, 462) = 4.69$, $p = .03$, $\eta_p^2 = .01$ with a small effect size. That is, the treatments condition was considered to be more informative than the control condition ($M_{Treatments} = 6.02$, $SD_{Treatments} = 1.17$, $M_{Control} = 5.68$, $SD_{Control} = 1.35$).

4.3.3.4   Perceived Suggestive Design

The Cronbach's alpha for the Perceived Suggestive Design scale was 0.73, indicating sufficient internal consistency reliability. I evaluated the success of suggestive design based on the claim and the data condition. The means and standard deviations are presented in Table 32. Table 33 presents the statistics. Results from a two-way ANOVA revealed a significant effect of the claim manipulation with a medium effect size, a significant effect of the data manipulation with a small effect size, and no interaction between claim and data manipulation with a small effect size. That is, a website featuring claim content significantly led to higher perceived suggestive design than a

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website without claim content. Likewise, a website presenting data content significantly induced a higher degree of perceived suggestive design than a website without data content. As a result, the manipulation of suggestive PDF was successful. Figure 10 presents the difference in perceived suggestive design between the claim and the data manipulation.

Suggestive Content PDF		Mean	Standard Deviation
Claim	**Data**		
No claim	No data	3.20	1.47
	Data	3.43	1.58
	Total	3.35	1.54
Claim	No data	4.10	1.88
	Data	4.85	1.57
	Total	4.40	1.80
Total	No data	3.81	1.80
	Data	4.00	1.72
	Total	3.91	1.76

Table 32. Means and standard deviations of perceived suggestive design in the claim and the data condition in empirical study 1

Effect	$F(1, 460)$	p	η_p^2
Claim	51.76	.00	.10
Data	9.15	.00	.02
Claim x data	2.64	.11	.01

Table 33. Two-way ANOVA in perceived suggestive design in empirical study 1
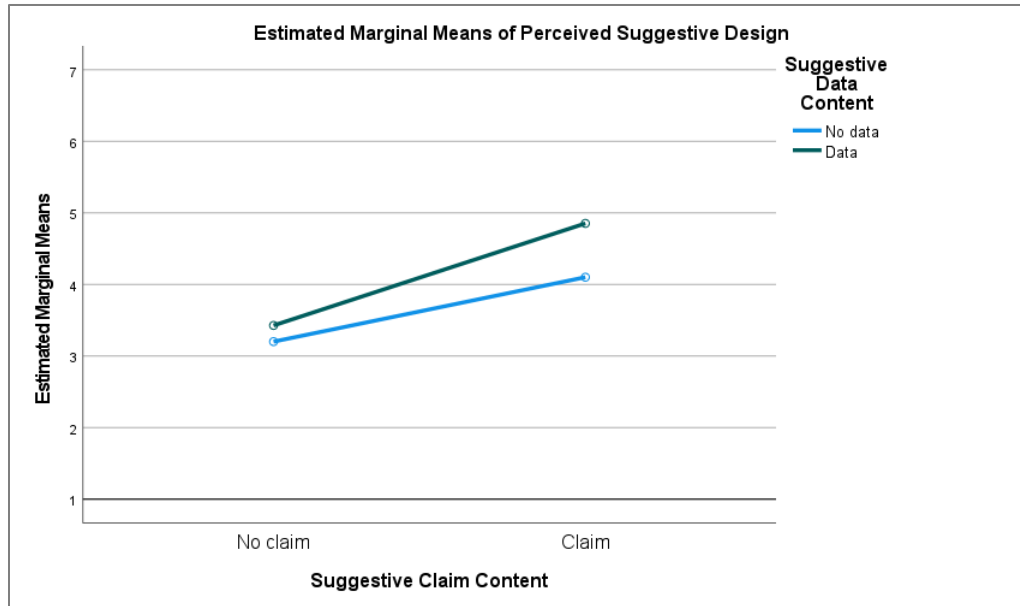
Figure 10. The difference in perceived suggestive design between the claim and the data condition in empirical study 1

4.3.3.5   Discussion of Manipulation Checks

The above manipulation checks provide support for the successful claim content manipulation. Specifically, the claim-only (C) and the claim with data content (C & D, D → C) condition fit with the claim content more than and are more suggestive than the data-only (D) condition and the control (no claim – no data) condition. Thus, the claim content manipulation was successful. For the data content manipulation, there was no difference in perceived informative design among the claim-only (C), the data-only (D), and the claim with data content (C & D and D → C), and the control condition. However, all treatments were perceived as more informative than the control condition. This provides partial support for the success of data content manipulation.

4.3.4   Results on Perceived Personalization

The Cronbach's alpha for the Perceived Personalization scale was 0.77, suggesting sufficient internal consistency reliability. A two-way ANOVA with the claim and data condition was

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analyzed. The means and standard deviations are presented in Table 34. The statistics are reported in Table 35. Results indicated no significant effect of the claim content with a trivial effect size, a significant effect of the data content with a small effect size, and no interaction between claim and data content with a trivial effect size. Specifically, a website with data content had a significantly higher level of perceived personalization than a website without data content. As a result, data content had a significant impact on perceived personalization. See Figure 11 for the difference in perceived personalization between the claim and the data condition.

Suggestive Content PDF		Mean	Standard Deviation
Claim	**Data**		
No claim	No data	4.41	1.38
	Data	4.55	1.24
	Total	4.50	1.29
Claim	No data	4.35	1.35
	Data	4.79	1.11
	Total	4.53	1.28
Total	No data	4.37	1.36
	Data	4.64	1.20
	Total	4.52	1.28

Table 34. Means and standard deviations of perceived personalization in the claim and the data condition in empirical study 1

Effect	$F(1, 460)$	p	η_p^2
Claim	0.51	.48	.00
Data	5.25	.02	.01
Claim x data	1.46	.23	.00

Table 35. Two-way ANOVA in perceived personalization in empirical study 1
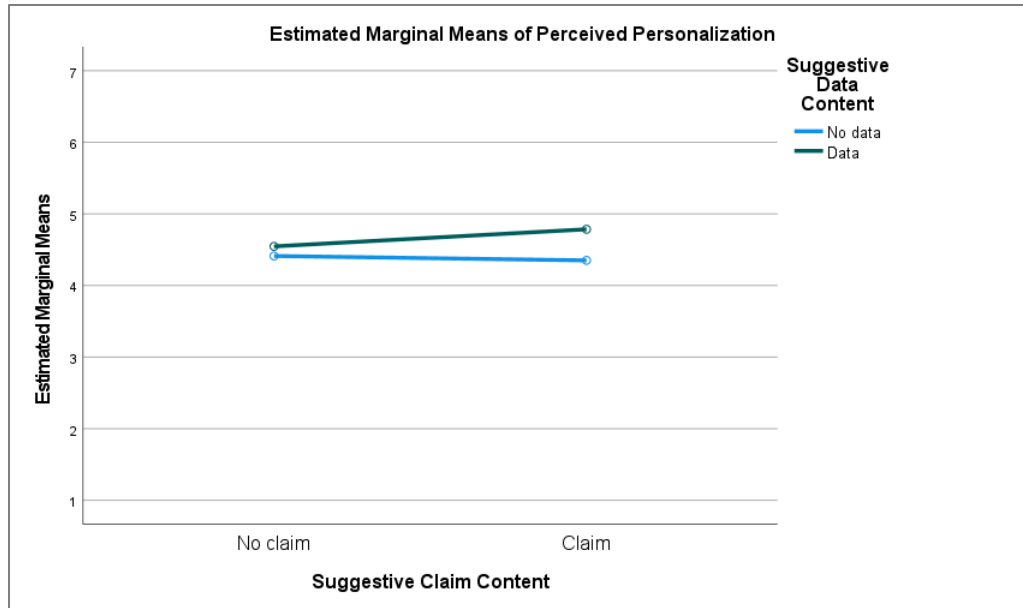
Figure 11. The difference in perceived personalization between the claim and the data condition in empirical study 1

4.3.4.1 Discussion on Perceived Personalization

The above analysis provides partial support for the effect of suggestive content on perceived personalization, thus partially supporting H12. In particular, data content stimulates higher perceived personalization than no data content. However, inconsistent with my expectation, claim content does not contribute to perceived personalization. These indicate that data content shapes users' perceived personalization, while claim content alone does not.

4.3.5 Results on Persuasion Awareness

4.3.5.1 Perceived Persuasion

Perceived persuasion was a multi-dimensional construct (Ham et al. 2015). According to the measurement pretest (see E.2), both perceived persuasive intent and perceived agent benefits items were placed in the same group. Therefore, perceived persuasion included perceived persuasive intent and perceived agent benefits in terms of sales intent in this analysis. The Cronbach's alpha

for the Perceived Persuasive Intent scale and the Agent Benefits (website benefits – sales) scale were 0.84 and 0.63 after one agent benefits item was dropped (WBenefits_S1), respectively, indicating sufficient internal consistency reliability.

4.3.5.1.1 Effect of Claim and Data

A two-way MANOVA with claim and data content was conducted. The means and standard deviations of perceived persuasive intent and agent benefits are reported in Table 36 and Table 37, respectively. Table 38 presents the statistics. Results revealed that there was a significant effect of claim content with a small effect size, a significant effect of data content with a small effect size, and no significant interaction between claim and data content with a trivial effect size. Follow-up tests using a two-way ANOVA were conducted. Results showed that there was a significant effect of the claim condition on perceived persuasive intent with a small effect size and on perceived agent benefits with a small effect size. This demonstrated that claim content significantly shaped higher perceived persuasive intent and agent benefits than no claim content. Also, there was a significant effect of the data condition on perceived persuasive intent with a small effect size, and on perceived agent benefits with a small effect size. That is, data content drove higher perceived persuasive intent and agent benefits than no data content. However, no significant claim x data interaction was found on perceived persuasive intent with a trivial effect size, or on perceived agent benefits with a trivial effect size. Overall, these results showed that both claim and data content influenced both perceived persuasive intent and agent benefits. The presence of claim and data increased both perceptions. Figure 12 and Figure 13, respectively, show the difference in perceived persuasive intent and agent benefits between the claim and the data manipulation. I also

used the higher-order construct score of perceived persuasion and performed a one-way ANOVA
(see Appendix K K.2). Similar results were obtained.

Suggestive Content PDF		Mean	Standard Deviation
Claim	**Data**		
No claim	No data	2.75	1.35
	Data	2.93	1.35
	Total	2.87	1.35
Claim	No data	3.24	1.58
	Data	3.66	1.42
	Total	3.41	1.53
Total	No data	3.08	1.52
	Data	3.22	1.42
	Total	3.16	1.47

Table 36. Means and standard deviations of perceived persuasive intent in the claim and the data condition in empirical study 1

Suggestive Content PDF		Mean	Standard Deviation
Claim	**Data**		
No claim	No data	3.30	1.74
	Data	3.89	1.58
	Total	3.70	1.65
Claim	No data	3.94	1.72
	Data	4.44	1.52
	Total	4.14	1.66
Total	No data	3.73	1.75
	Data	4.11	1.58
	Total	3.93	1.67

Table 37. Means and standard deviations of perceived agent benefits (sales) in the claim and the data condition in empirical study 1

Effect		Wilk's Λ	F	p	η_p^2
Multivariate					
Claim		0.96	10.54[a]	.00	.04
Data		0.98	5.82 [a]	.00	.03
Claim x data		1.00	0.91 [a]	.40	.00
Between-subjects					
Claim	Perceived persuasive intent		18.85[b]	.00	.04
	Perceived agent benefits		14.97 [b]	.00	.03
Data	Perceived persuasive intent		4.54 [b]	.03	.01
	Perceived agent benefits		11.66 [b]	.00	.03
Claim x data	Perceived persuasive intent		0.73 [b]	.39	.00
	Perceived agent benefits		0.09 [b]	.76	.00

Note: [a] $F(2, 459)$, [b] $F(1, 460)$

Table 38. Two-way MANOVA and ANOVA in perceived persuasive intent and agent benefits in empirical study 1
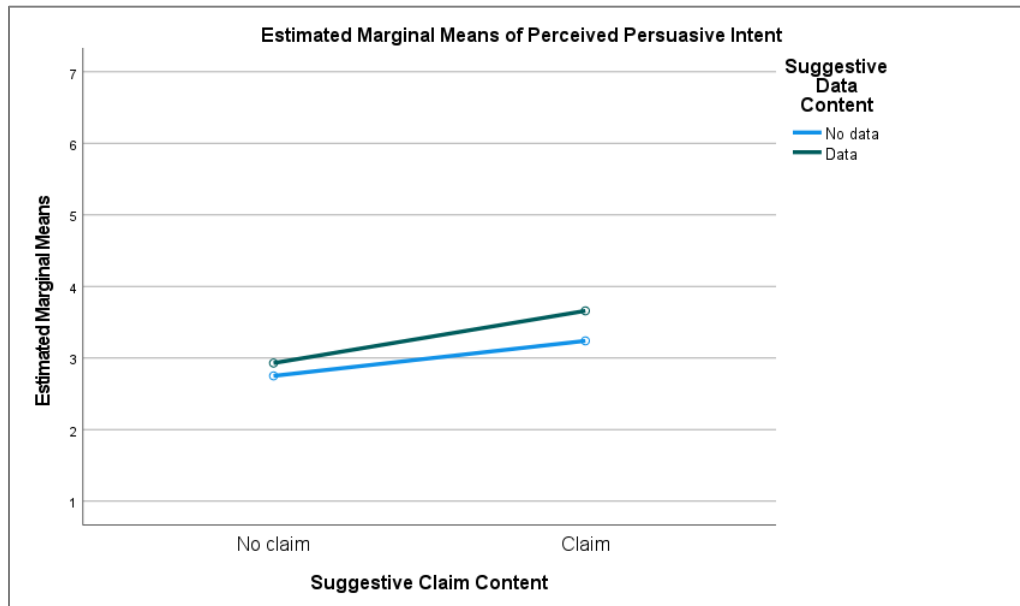
Figure 12. The difference in perceived persuasive intent between the claim and the data condition in empirical study 1
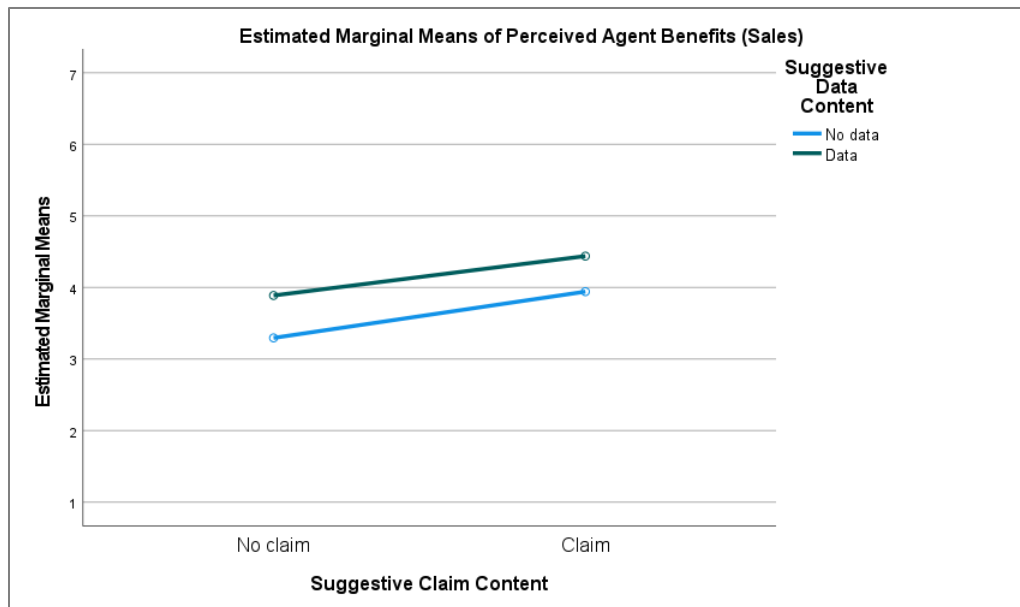
Figure 13. The difference in perceived agent benefits (sales) between the claim and the data condition in empirical study 1

4.3.5.1.2 Additional Evidence for the Differences among the 5 Conditions

Furthermore, a one-way MANOVA was performed to evaluate the difference among the control, "We recommend this," "Best-selling item," "Best-selling item. We recommend this.," and "Since this is best-selling, we recommend this." This analysis excluded "Buy this item," and "Low in stock" to better explain how the same claim, data, and their combination differed. Specifically, I aimed to assess the difference among the claim-only (C, "We recommend this"), the data-only (D, "Best-selling item"), the claim & data (C & D, "Best-selling item. We recommend this."), the data-supporting-claim (D → C, "Since this is best-selling, we recommend this."), and the control (no claim – no data). Table 39 reports the statistics. Results pointed out a significant effect of the suggestive condition with a small effect size. Thus, follow-up tests using a one-way ANOVA were conducted. Results showed that there was a significant effect of the suggestive condition on perceived persuasive intent with a medium effect size, and on perceived agent benefits with a medium effect size. Follow-up tests using a Bonferroni correction were run. See Table 40. Results

suggested that C significantly created higher perceived persuasive intent than the control. C & D significantly produced higher perceived persuasive intent than the control, and marginally significantly promoted higher perceived persuasive intent than D. D → C had a marginally significantly higher degree of perceived persuasive intent than the control. Analogous results were obtained for perceived agent benefits. C significantly induced higher perceived agent benefits than the control. C & D significantly led to higher perceived agent benefits than the control. D → C had significantly higher agent benefits than the control. No other significant differences were found. These results showed that a website featuring a claim—claim-only, claim & data, and data → claim—stimulated a higher level of both perceived persuasive intent and agent benefits than a website without a claim. However, there was no difference among the three claim-included conditions. This demonstrated that although providing a claim made users perceive persuasive intent and agent benefits, adding data alone or together with a claim did not make a difference in both perceptions. Also, I ran a one-way ANOVA in the higher-order perceived persuasion score and found similar results. See Appendix K K.2 for detail.

Effect		Wilk's Λ	F	p	η_p^2
Multivariate					
Condition		0.91	3.60[a]	.00	.04
Between-subjects					
Condition	Perceived persuasive intent		5.23[b]	.00	.06
	Perceived agent benefits		5.56[b]	.00	.07

Note: [a] $F(8, 624)$, [b] $F(4, 313)$

Table 39. One-way MANOVA and ANOVA in perceived persuasive intent and agent benefits in empirical study 1

(I) Condition	(J) Condition	Mean Difference (I – J)	SE	p	95% CI LL	UL
Perceived persuasive intent						
1 Control	2	-0.78**	0.24	.01	-1.47	-0.10
	3	-0.29	0.24	1.00	-0.96	0.37
	4	-0.93***	0.24	.00	-1.62	-0.24
	5	-0.86*	0.31	.06	-1.74	0.01
2 We recommend this	1	0.78**	0.24	.01	0.10	1.47
	3	0.49	0.24	.37	-0.17	1.16
	4	-0.15	0.24	1.00	-0.84	0.55
	5	-0.08	0.31	1.00	-0.95	0.80
3 Best-selling item	1	0.29	0.24	1.00	-0.37	0.96
	2	-0.49	0.24	.37	-1.16	0.17
	4	-0.64*	0.24	.08	-1.32	0.04
	5	-0.57	0.30	.62	-1.43	0.29
4 Best-selling item. We recommend this.	1	0.93***	0.24	.00	0.24	1.62
	2	0.15	0.24	1.00	-0.55	0.84
	3	0.64*	0.24	.08	-0.04	1.32
	5	0.07	0.31	1.00	-0.81	0.95
5 Since this is best-selling, we recommend this.	1	0.86*	0.31	.06	-0.01	1.74
	2	0.08	0.31	1.00	-0.80	0.95

(I) Condition	(J) Condition	Mean Difference (I – J)	SE	p	95% CI LL	95% CI UL
	3	0.57	0.30	.62	-0.29	1.43
	4	-0.07	0.31	1.00	-0.95	0.81
Perceived agent benefits						
1 Control	2	-0.83**	0.27	.02	-1.59	-0.07
	3	-0.58	0.26	.28	-1.33	0.16
	4	-1.06***	0.27	.00	-1.84	-0.29
	5	-1.32***	0.35	.00	-2.30	-0.34
2 We recommend this	1	0.83**	0.27	.02	0.07	1.59
	3	0.25	0.26	1.00	-0.50	0.99
	4	-0.23	0.27	1.00	-1.01	0.54
	5	-0.49	0.35	1.00	-1.47	0.49
3 Best-selling item	1	0.58	0.26	.28	-0.16	1.33
	2	-0.25	0.26	1.00	-0.99	0.50
	4	-0.48	0.27	.74	-1.24	0.28
	5	-0.73	0.34	.32	-1.70	0.23
4 Best-selling item. We recommend this.	1	1.06***	0.27	.00	0.29	1.84
	2	0.23	0.27	1.00	-0.54	1.01
	3	0.48	0.27	.74	-0.28	1.24
	5	-0.25	0.35	1.00	-1.24	0.73

(I) Condition	(J) Condition	Mean Difference (I – J)	SE	p	95% CI	
					LL	UL
5 Since this is best-selling, we recommend this.	1	1.32***	0.35	.00	0.34	2.30
	2	0.49	0.35	1.00	-0.49	1.47
	3	0.73	0.34	.32	-0.23	1.70
	4	0.25	0.35	1.00	-0.73	1.24

Note: * $p < .10$, ** $p < .05$, *** $p < .001$, CI = confidence interval, LL = lower limit, UL = upper limit

Table 40. Multiple comparisons of the suggestive content conditions in terms of perceived persuasive intent and agent benefits using a Bonferroni correction in empirical study 1

4.3.5.1.3   Discussion on Perceived Persuasion

Overall, providing claim or data content increases perceived persuasion, therefore supporting H8. While the data-only content (D) and the control condition (no C – no D) do not differ, a claim with data content (C & D and D → C) induces higher perceived persuasion than a claim-only (C). Providing a claim, regardless of data (C, C & D, and D → C), leads to higher perceived persuasion than no claim – no data and the data-only content (D), thus supporting H13a. Therefore, either adding data to a claim or supporting it with data does not increase or decrease perceived persuasion, thereby supporting H13b.

4.3.5.2   Perceived Assistance

Based on the measurement pretest (see E.2), perceived assistive intent and perceived user benefits were placed in the same category. Thus, both are part of perceived assistance in this analysis. The Cronbach's alpha for the Perceived Assistive Intent and the User Benefits scale was 0.88 and 0.85 after a reversed item was removed (UBenefits3_R), respectively, suggesting satisfied internal consistency reliability.

4.3.5.2.1   Effect of Claim and Data

A two-way MANOVA was performed to examine the difference between claim and data content. The means and standard deviations of perceived assistance and user benefits are reported in Table 41 and Table 42, respectively. See Table 43 for the statistics. Results showed that there was no significant effect of claim content with a trivial effect size, a significant effect of data content with a small effect size, and no significant interaction between claim and data content with a trivial effect size. Follow-up tests using a two-way ANOVA were conducted. Results showed that there

was no significant effect of the claim condition on perceived assistive intent with a trivial effect size or on perceived user benefits with a trivial effect size. This conveyed that claim content did not shape perceived assistive intent and user benefits. However, there was a significant effect of the data condition on perceived assistive intent with a small effect size, and a marginally significant effect on perceived user benefits with a small effect size. That is, data content led to higher perceived assistive intent and user benefits than no data content. No significant claim x data interaction was found on perceived assistive intent with a trivial effect size or on perceived user benefits with a trivial effect size. Overall, these results revealed that only data content affected both perceived assistive intent and user benefits. The presence of data increased both perceptions. Figure 14 and Figure 15 show the difference in perceived assistive intent and user benefits between the claim and the data manipulation, respectively. As well, I performed a one-way ANOVA in the higher-order perceived assistance score (see Appendix K K.3). Similar results were obtained.

Suggestive Content PDF		Mean	Standard Deviation
Claim	**Data**		
No claim	No data	4.64	1.48
	Data	5.03	1.33
	Total	4.90	1.39
Claim	No data	4.83	1.35
	Data	5.17	1.16
	Total	4.97	1.28
Total	No data	4.77	1.39
	Data	5.09	1.26
	Total	4.94	1.33

Table 41. Means and standard deviations of perceived assistive intent in the claim and the data condition in empirical study 1

Suggestive Content PDF		Mean	Standard Deviation
Claim	**Data**		
No claim	No data	4.92	1.30
	Data	5.07	1.23
	Total	5.02	1.25
Claim	No data	5.00	1.28
	Data	5.31	1.14
	Total	5.12	1.23
Total	No data	4.97	1.28
	Data	5.16	1.20
	Total	5.08	1.24

Table 42. Means and standard deviations of perceived user benefits in the claim and the data condition in empirical study 1

Effect		Wilk's Λ	F	p	η_p^2
Multivariate					
Claim		1.00	1.02[a]	.36	.00
Data		0.98	4.09[a]	.02	.02
Claim x data		1.00	0.67[a]	.52	.00
Between-subjects					
Claim	Perceived assistive intent		1.675[b]	.20	.00
	Perceived user benefits		1.77[b]	.18	.00
Data	Perceived assistive intent		8.17[b]	.00	.02
	Perceived user benefits		3.58[b]	.06	.01
Claim x data	Perceived assistive intent		0.04[b]	.85	.00
	Perceived user benefits		0.48[b]	.49	.00

Note: [a] $F(2, 459)$, [b] $F(1, 460)$

Table 43. Two-way MANOVA and ANOVA in perceived assistive intent and user benefits in empirical study 1
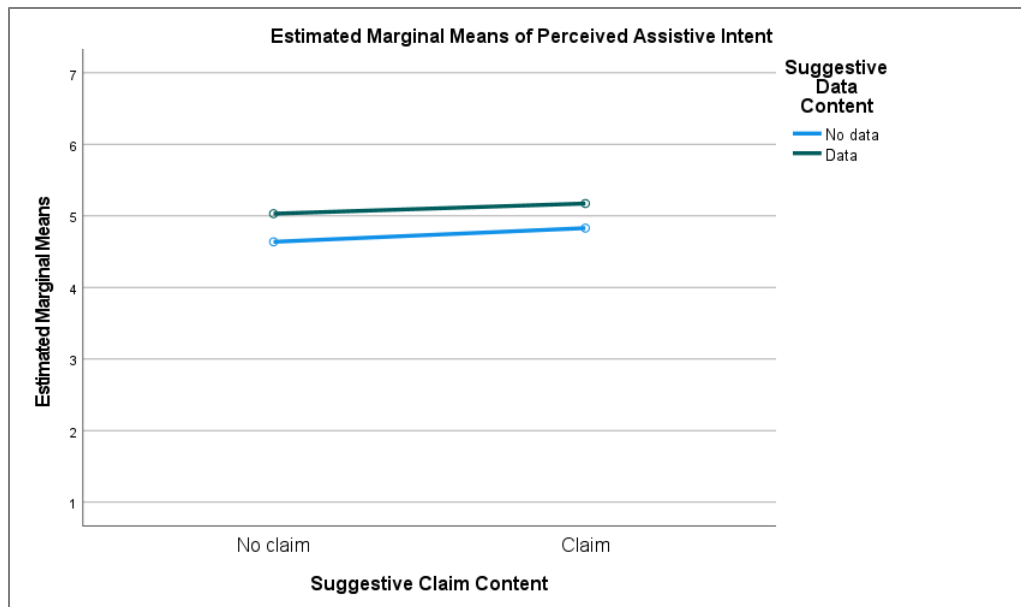
Figure 14. The difference in perceived assistive intent between the claim and the data condition in empirical study 1
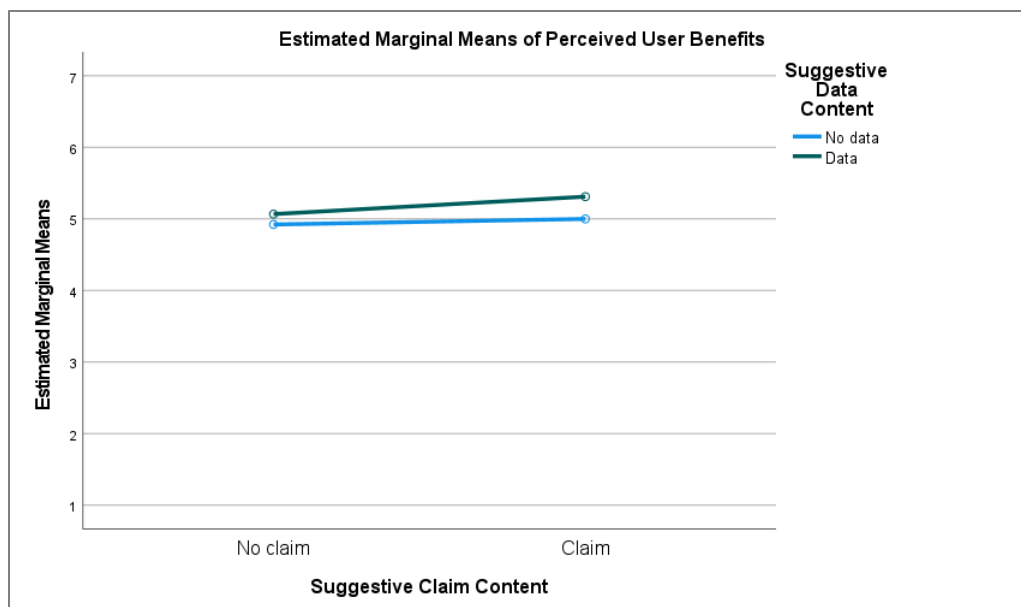
Figure 15. The difference in perceived user benefits between the claim and the data condition in empirical study 1

4.3.5.2.2   Additional Evidence for the Differences among the 5 Conditions

Moreover, a one-way MANOVA was conducted to examine the difference among the no claim –

no data (control), the claim-only (C, "We recommend this"), the data-only (D, "Best-selling

item"), the claim & data (C & D, "Best-selling item. We recommend this."), and the data → claim (D → C, "Since this is best-selling, we recommend this."). The statistics appear in Table 41. Results showed that a significant effect of the suggestive condition with a small effect size. Therefore, follow-up tests using a one-way ANOVA were conducted. Results showed that there was a marginally significant effect of the condition on perceived assistive intent with a small effect size. However, no significant effect of on perceived agent benefits was found, $F(4, 313) = 1.30$, $p = .27$, $\eta_p^2 = .02$ with a small effect size. Follow-up tests using a Bonferroni correction were run. Results suggested that D → C had a marginally significantly higher degree of perceived assistive intent than the control, $p = .07$. No other significant differences were found, $p > .05$. These results showed that only a website featuring a claim supported with data (D → C) increased perceived assistive intent than a website without a claim and data (control). This illustrated that a claim needed data to support it, or else it did not make any difference, in terms of perceived assistive intent. Also, a one-way ANOVA in the higher-order perceived assistance score was performed (see Appendix K K.3). However, no significant difference was found.

Effect		Wilk's Λ	F	p	η_p^2
Multivariate					
Condition		0.95	1.94[a]	.05	.02
Between-subjects					
Condition	Perceived persuasive intent		2.34[b]	.06	.03
	Perceived agent benefits		1.30[b]	.27	.02

Note: [a] $F(8, 624)$, [b] $F(4, 313)$

Table 44. One-way MANOVA in perceived persuasive intent and agent benefits in empirical study 1

4.3.5.2.3   Perceived Personalization as a Mediator

I investigated the mediation effect of perceived personalization on the relationship between the suggestive content, claim and data content, on perceived assistive intent and user benefits. According to Baron and Kenny (1986), four criteria should be established. First, the relationship between independent variables and a dependent variable should be significant. That is, the suggestive content should be a significant predictor of perceived assistance. A two-way MANOVA with claim and data content as an independent variable was conducted. Previously, I showed that only data content significantly predicted perceived assistance with a small effect size. This supported that data content was a significant predictor of perceived assistive intent. Secondly, there should be a significant relationship between an independent variable and a mediator. In other words, data content should be a significant predictor of perceived personalization. This was supported in the previous analysis (see 4.3.4). Thirdly, the relationship between a mediator and a dependent variable should be significant. Finally, after controlling for a mediator, the relationship between an independent variable and a dependent variable should become nonsignificant or reduced. To test the third and fourth criteria, I applied a two-way MANCOVA with claim and data content as an independent variable and perceived personalization as a covariate. Results showed that data content became non-significant after controlling for perceived personalization, Wilk's Λ = 0.99, $F(2, 458) = 1.64$, $p = .20$, $\eta_p^2 = .01$ with a small effect size, while perceived personalization significantly predicted perceived assistance, Wilk's $\Lambda = 0.53$, $F(2, 458) = 206.34$, $p < .001$, $\eta_p^2 =$ .47 with a large effect size. Follow-up analyses using a two-way ANCOVA were performed. Results revealed that only perceived personalization significantly influenced perceived assistive intent, $F(1, 459) = 342.64$, $p < .001$, $\eta_p^2 = .43$ with a large effect size, and perceived user benefits, $F(1, 459) = 270.21$, $p < .001$, $\eta_p^2 = .37$ with a large effect size. Hence, perceived personalization

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mediated the effect of data content on perceived assistance. Specifically, data content influenced perceived personalization, which, in turn, affected perceived assistance.

4.3.5.2.4   Discussion on Perceived Assistance

The above analyses provide support for the effect of data content on perceived assistance. That is, giving data increases perceived assistance, therefore partially supporting H10. Also, adding data to a claim (C & D) does not differ from no claim – no data content. It is only when data content supports a claim that enhances perceived assistance, thus partially supporting H14a. Also, perceived personalization mediates the effect of data content on perceived assistance, thereby supporting H12 and H16. In other words, data content strengthens perceived personalization, which, in turn, increases to perceived assistance.

4.3.6   Results on Perceived Agent Costs

The Cronbach's alpha for Perceived Agent Costs scale was 0.88, suggesting sufficient internal consistency reliability.

4.3.6.1   Effect of Claim and Data

A two-way ANOVA with the claim and data condition was performed. The means and standard deviations are reported in Table 45. The statistics appear in Table 46. Results demonstrated no significant effect of the claim condition with a trivial effect size, marginally significant effect of the data condition with a small effect size, and no interaction between claim and data with a trivial effect size. This conveyed that only data content affected perceived agent costs. Specifically, data led to higher perceived agent costs than no data. See Figure 16 for the difference in perceived agent costs between the claim and the data condition.

Suggestive Content PDF		Mean	Standard Deviation
Claim	**Data**		
No claim	No data	4.40	1.44
	Data	4.67	1.47
	Total	4.58	1.46
Claim	No data	4.57	1.57
	Data	4.81	1.43
	Total	4.67	1.52
Total	No data	4.52	1.53
	Data	4.72	1.45
	Total	4.63	1.49

Table 45. Means and standard deviations of perceived agent costs in the claim and the data condition in empirical study 1

Effect	$F(1, 460)$	p	η_p^2
Claim	1.14	.29	.00
Data	2.93	.09	.01
Claim x data	0.01	.92	.00

Table 46. Two-way ANOVA in perceived agent costs in empirical study 1
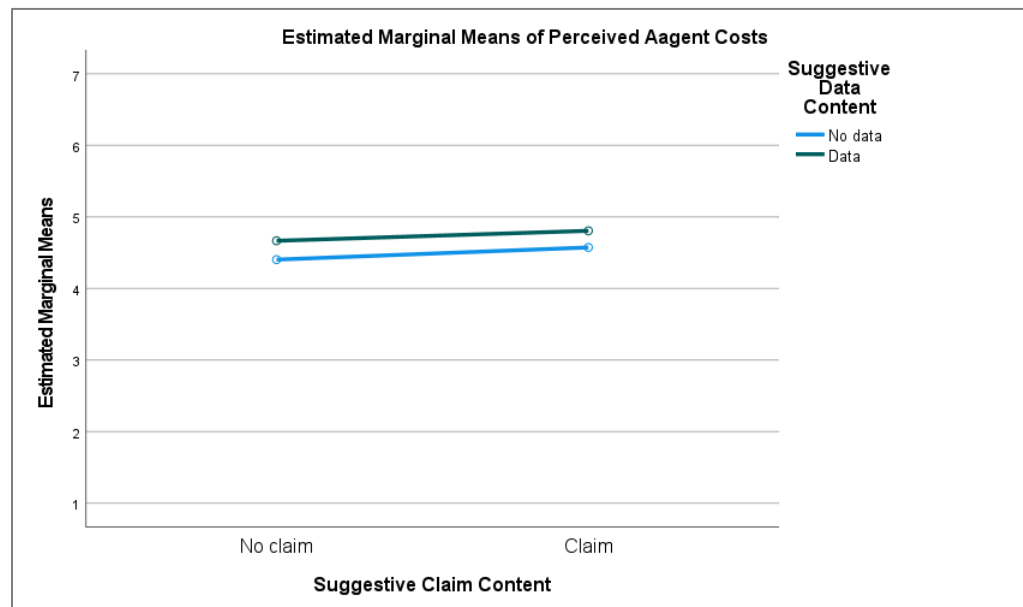
Figure 16. The difference in perceived agent costs between the claim and the data condition in empirical study 1

4.3.6.2   Additional Evidence for the Differences among the 5 Conditions

A one-way ANOVA was performed to assess the difference among the no claim – no data (control), the claim-only (C, "We recommend this"), the data-only (D, "Best-selling item"), the claim & data (C & D, "Best-selling item. We recommend this."), and the data → claim (D → C, "Since this is best-selling, we recommend this."). Results showed that no significant effect of the suggestive content condition, $F(4, 313) = 1.34$, $p = .23$, $\eta_p^2 = .02$ with a small effect size. This revealed that there was no difference in perceived agent costs among these five conditions.

4.3.6.3   Perceived Personalization as a Mediator

To examine the mediation effect of perceived personalization on the relationship between the suggestive content, claim and data, on perceived agent costs. Owing to Baron and Kenny (1986), there are four criteria to establish. First, the suggestive content should be a significant predictor of perceived agent costs. Results from the previous section showed that only data content marginally significantly predicted perceived agent costs (see 4.3.5.2 for detail). Secondly, there should be a significant relationship between data content and perceived personalization. This was supported in the previous analysis (see 4.3.4). Thirdly, the relationship between a perceived personalization and agent costs should be significant. Finally, after controlling for perceived personalization, the relationship between data content and perceived agent costs should become nonsignificant or decreased. To test the third and fourth criteria, I utilized a two-way ANCOVA with claim and data content as an independent variable and perceived personalization as a covariate. Results showed that data content became non-significant after controlling for perceived personalization, $F(1, 459)$ = 0.35, $p = .55$, $\eta_p^2 < .001$ with a trivial effect size, while perceived personalization significantly predicted perceived agent costs, $F(1, 459) = 174.07$, $p < .001$, $\eta_p^2 = .28$ with a large effect size.

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Thus, perceived personalization mediated the effect of data content on perceived agent costs. That is, data content affected perceived personalization, which, in turn, increased perceived agent costs.

4.3.6.4   Discussion on Perceived Agent Costs

The above analyses offer marginal support for the effect of data content on perceived agent costs, and the mediational evidence that perceived personalization mediates this observed effect, hence partially supporting H12 and H7. In other words, providing data content increases perceived personalization, thus increasing perceived agent costs.

4.3.7   Impacts of Persuasion Awareness and Relevant Constructs

PLS was used to examine the structural model proposed on the right-hand side of Figure 6.

4.3.7.1   Construct Reliability and Validity

First, the measurement model was evaluated in terms of internal consistency and discriminant validity (Barclay et al. 1995). The measurement items, except Appropriate3 (loading = 0.67), UCost_E1 (loadings = 0.64), and WBenefits_S3 (loading = 0.62), generally load heavily on their respective constructs, with loadings greater than 0.70. Loadings and cross-loadings of all items are reported in Table 47. The internal consistency reliability was supported by the composite reliability and Cronbach's alpha greater than 0.70 (see Table 48), except perceived agent benefits ($\alpha = 0.63$). According to Barclay et al. (1995), the square root of average variance extracted (AVE) of each latent variable should be greater than the correlation between itself and others. This was evident (see Table 48). There was also no loading above the loadings of the respective latent variables (see Table 47). Therefore, discriminant validity was satisfactory.

	RE	AP	AS	AS-UB	AT	IN	PE	PE-AB	UB	UC	AB	AC
Anger1	**0.82**	-0.40	-0.25	-0.28	-0.37	-0.31	0.15	0.12	-0.26	0.16	0.04	-0.30
Anger2	**0.94**	-0.61	-0.43	-0.49	-0.57	-0.52	0.11	0.08	-0.49	0.21	0.01	-0.52
Anger3	**0.95**	-0.59	-0.42	-0.49	-0.54	-0.48	0.14	0.10	-0.49	0.19	0.02	-0.50
Anger4	**0.95**	-0.55	-0.38	-0.44	-0.49	-0.46	0.12	0.09	-0.44	0.21	0.01	-0.48
Appropriate1	-0.55	**0.92**	0.57	0.64	0.72	0.61	0.00	0.03	0.62	-0.09	0.06	0.75
Appropriate2	-0.55	**0.92**	0.53	0.58	0.69	0.55	-0.08	-0.05	0.54	-0.09	0.00	0.72
Appropriate3	-0.41	**0.67**	0.34	0.38	0.43	0.33	-0.24	-0.22	0.36	-0.02	-0.14	0.40
Assist1	-0.36	0.52	**0.91**	**0.88**	0.51	0.57	0.07	0.09	0.67	-0.03	0.10	0.54
Assist2	-0.35	0.51	**0.91**	**0.86**	0.49	0.51	0.11	0.13	0.62	-0.01	0.13	0.49
Assist3	-0.40	0.53	**0.87**	**0.82**	0.50	0.49	0.12	0.15	0.59	0.00	0.16	0.51
Att1	-0.50	0.70	0.51	0.59	**0.94**	0.70	-0.03	0.01	0.60	-0.09	0.07	0.76
Att2	-0.53	0.74	0.55	0.63	**0.94**	0.74	-0.05	-0.01	0.62	-0.04	0.06	0.80
Att3	-0.49	0.62	0.48	0.54	**0.89**	0.61	-0.06	-0.03	0.54	-0.09	0.03	0.68
Inten1	-0.46	0.58	0.57	0.64	0.73	**0.97**	-0.01	0.01	0.62	-0.08	0.04	0.70
Inten2	-0.48	0.61	0.58	0.66	0.74	**0.96**	0.00	0.02	0.65	-0.08	0.03	0.71
Inten3	-0.47	0.55	0.53	0.59	0.65	**0.93**	-0.06	-0.03	0.58	-0.07	0.02	0.63
Persuasive1	0.19	-0.15	0.04	0.00	-0.09	-0.08	**0.87**	**0.82**	-0.06	0.00	0.54	-0.04
Persuasive2	0.10	-0.05	0.13	0.09	0.00	0.03	**0.88**	**0.82**	0.02	-0.02	0.55	0.05
Persuasive3	0.09	-0.06	0.12	0.06	-0.05	0.00	**0.86**	**0.83**	-0.03	0.07	0.58	-0.01
UBenefit1	-0.49	0.58	0.65	**0.83**	0.62	0.65	-0.06	-0.02	**0.93**	-0.01	0.04	0.59

	RE	AP	AS	AS-UB	AT	IN	PE	PE-AB	UB	UC	AB	AC
UBenefit2	-0.40	0.56	0.66	**0.84**	0.57	0.56	0.01	0.03	**0.93**	0.00	0.06	0.58
UCost_E1	0.11	0.02	0.06	0.09	-0.02	-0.01	-0.05	-0.03	0.12	**0.64**	0.00	0.05
UCost_E2	0.20	-0.05	0.04	0.05	-0.06	-0.06	0.01	0.03	0.04	**0.84**	0.07	-0.01
UCost_E3	0.16	-0.07	-0.03	-0.02	-0.07	-0.07	0.01	0.01	0.00	**0.93**	0.00	-0.03
WBenefit_S2	0.07	-0.02	0.16	0.13	0.05	0.03	0.65	**0.82**	0.08	0.06	**0.89**	0.05
WBenefit_S3	-0.05	0.00	0.08	0.05	0.06	0.02	0.41	**0.62**	0.00	0.00	**0.81**	0.09
WCost1	-0.37	0.62	0.47	0.53	0.67	0.59	0.04	0.06	0.50	-0.01	0.08	**0.87**
WCost2	-0.46	0.69	0.55	0.61	0.75	0.67	0.02	0.05	0.59	-0.02	0.09	**0.92**
WCost3	-0.52	0.73	0.52	0.59	0.75	0.65	-0.06	-0.02	0.57	-0.07	0.05	**0.89**

Note: RE = reactance (anger), AP = perceived appropriateness, AS = perceived assistive intent, AS-UB = perceived assistance (perceived assistive intent – perceived user benefits), AT = attitudes towards an agent, IN = intention to use an agent, PE = perceived persuasive intent, PE-AB = perceived persuasion (perceived persuasive intent – perceived agent benefits), UB = perceived user benefits, UC = perceived user costs, AB = perceived agent benefits, AC = perceived agent costs, factor loadings to their respective construct are in bold

Table 47. Loadings and cross-loadings of measures in empirical study 1

	α	CR	AVE	RE	AP	AS	AS-UB	AT	IN	PE	PE-AB	UB	UC	AB	AC
RE	0.94	0.95	0.84	0.92											
AP	0.79	0.88	0.71	-0.60	0.84										
AS	0.88	0.93	0.81	-0.41	0.58	0.90									
AS-UB	0.90	0.92	0.71	-0.47	0.64	0.95	0.84								
AT	0.91	0.95	0.85	-0.55	0.75	0.55	0.64	0.92							

	α	CR	AVE	RE	AP	AS	AS-UB	AT	IN	PE	PE-AB	UB	UC	AB	AC
IN	0.95	0.97	0.91	-0.49	0.61	0.59	0.66	0.74	0.95						
PE	0.84	0.90	0.75	0.14	-0.10	0.11	0.06	-0.05	-0.02	0.87					
PE-AB	0.84	0.89	0.62	0.10	-0.07	0.14	0.09	-0.01	0.00	0.95	0.79				
UB	0.85	0.93	0.87	-0.47	0.61	0.70	0.89	0.64	0.65	-0.03	0.00	0.93			
UC	0.85	0.85	0.66	0.21	-0.09	-0.02	-0.01	-0.08	-0.08	0.02	0.03	-0.01	0.81		
AB	0.63	0.84	0.73	0.02	-0.01	0.14	0.11	0.06	0.03	0.64	0.85	0.05	0.04	0.85	
AC	0.88	0.92	0.80	-0.51	0.76	0.57	0.64	0.81	0.72	0.00	0.03	0.62	-0.04	0.08	0.90

Note: α = Cronbach's alpha, CR = composite reliability, AVE = average variance extracted, RE = reactance (anger), AP = perceived appropriateness, AS = perceived assistive intent, AS-UB = perceived assistance (perceived assistive intent – perceived user benefits), AT = attitudes towards an agent, IN = intention to use an agent, PE = perceived persuasive intent, PE-AB = perceived persuasion (perceived persuasive intent – perceived agent benefits), UB = perceived user benefits, UC = perceived user costs, AB = perceived agent benefits, AC = perceived agent costs, off-diagonal = correlations, diagonal = the square root of AVE

Table 48. Internal consistency and discriminant validity in empirical study 1

4.3.7.2 Common Method Bias

To identify the common method bias (CMB), I followed Kock et al. (2012)'s full collinearity test (Kock 2017). First, I created a random dummy variable with values varying from 0 to 1. Next, I developed a model where all constructs appeared in Figure 6 pointed at this dummy variable and performed the PLS analysis. According to Kock (2017), "the occurrence of a VIF greater than 3.3 is proposed as an indication of pathological collinearity and also as an indication that a model may be contaminated by common method bias" (p. 253). Following this, I inspected all VIFs resulting from the PLS analysis in Table 49. Results reveal that CMB would not be a concern for this model, since all VIFs are lower than 3.3.

Construct	*VIF*
Reactance (anger)	1.55
Perceived appropriateness	1.19
Perceived assistance	1.84
Attitudes	2.08
Intention	1.31
Perceived personalization	1.07
Perceived persuasion	1.09
Perceived user costs	1.09
Perceived agent costs	1.20

Table 49. VIFs of the constructs in the structural model in empirical study 1

4.3.7.3 Structural Model

Bootstrap resampling was performed on the structural model to investigate path significance. Results (all conditions) depicted in Table 50 and Figure 17 revealed that perceived persuasion (higher-order construct: perceived persuasive intent – perceived agent benefits) had a significant

and negative impact on perceived appropriateness, thus supporting H1. Results also showed that perceived assistance (higher-order construct: perceived assistive intent – perceived agent benefits) had a significant and positive impact on perceived appropriateness, therefore supporting H2. However, perceived user costs did not show a significant relationship with perceived appropriateness, thereby failing to support H3. Perceived agent costs had a significant and positive effect on perceived appropriateness, hence supporting H4. The model accounted for 64% of the variances in perceived appropriateness. It significantly influenced cognitive-behavioral responses, thereby supporting H5. Specifically, in line with PKM, perceived appropriateness had a significant and negative impact on reactance. That is, perceived appropriateness decreased users' reactance to persuasive design. Also, perceived appropriateness had a significant and positive association with attitudes towards an agent. In line with reactance theory, reactance had a significant and negative effect on attitudes. Both perceived appropriateness and reactance accounted for 57% of the variance in attitudes. Attitudes, in turn, significantly and positively affected users' intention to use the agent. The model accounted for 55% of the variance in intention.

Effect	R^2	t	p
Perceived appropriateness	0.64		
Perceived persuasion → perceived appropriateness		3.62	.00
Perceived assistance → perceived appropriateness		6.15	.00
Perceived user costs → perceived appropriateness		1.56	.12
Perceived agent costs → perceived appropriateness		14.44	.00
Reactance	0.36		
Perceived appropriateness → reactance		15.97	.00
Attitudes towards an agent	0.57		
Perceived appropriateness → attitudes		14.33	.00
Reactance → attitudes		2.89	.00

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Effect	R^2	t	p
Intention to use an agent	0.55		
Attitudes → Intention		36.29	.00

Table 50. Structural path analysis using PLS in empirical study 1 (all conditions)

In addition, bootstrap resampling was conducted on the structural model for the treatment conditions only. As the control condition did not have a targeted product, objective-behavioral responses—targeted product selected and targeted product considered (compared/viewed)—were available for the treatment conditions only. Results (treatment conditions with GA track only) shown in Table 50 and Figure 18 indicated similar results to those in Table 51 and Figure 17. Moreover, perceived persuasion had a significant and positive effect on both targeted product selection and targeted product consideration. Consistent with PKM's prediction, those who were aware of a persuasion attempt were more likely to carefully evaluate such an attempt and make a decision based on whether that fitted their interests. That is, participants who perceived persuasion of the website took a targeted product into their consideration by adding it to their consideration set or viewing it in more detail. Also, they were more likely to choose the targeted product. Nevertheless, perceived assistance did not have a significant effect on either targeted product selection or targeted product consideration. This is inconsistent with my expectation that perceived assistance will attribute to objective responses. In sum, 4% of the variance in targeted selection and 6% of the variance in targeted product consideration were explained.

Effect	R^2	t	p
Perceived appropriateness	0.65		
Perceived persuasion → perceived appropriateness		3.81	.00
Perceived assistance → perceived appropriateness		6.88	.00
Perceived user costs → perceived appropriateness		0.63	.53

Effect	R^2	t	p
Perceived agent costs → perceived appropriateness		10.50	.00
Reactance	0.36		
Perceived appropriateness → reactance		11.76	.00
Attitudes towards an agent	0.56		
Perceived appropriateness → attitudes		9.88	.00
Reactance → attitudes		2.42	.02
Intention to use an agent	0.60		
Attitudes → Intention		30.92	.00
Targeted selection	0.04		
Perceived persuasion → targeted selection		3.57	.00
Perceived assistance → targeted selection		0.86	.39
Targeted consideration	0.06		
Perceived persuasion → targeted selection		4.61	.00
Perceived assistance → targeted selection		0.08	.94

Table 51. Structural path analysis using PLS in empirical study 1 (treatment conditions with GA track only)
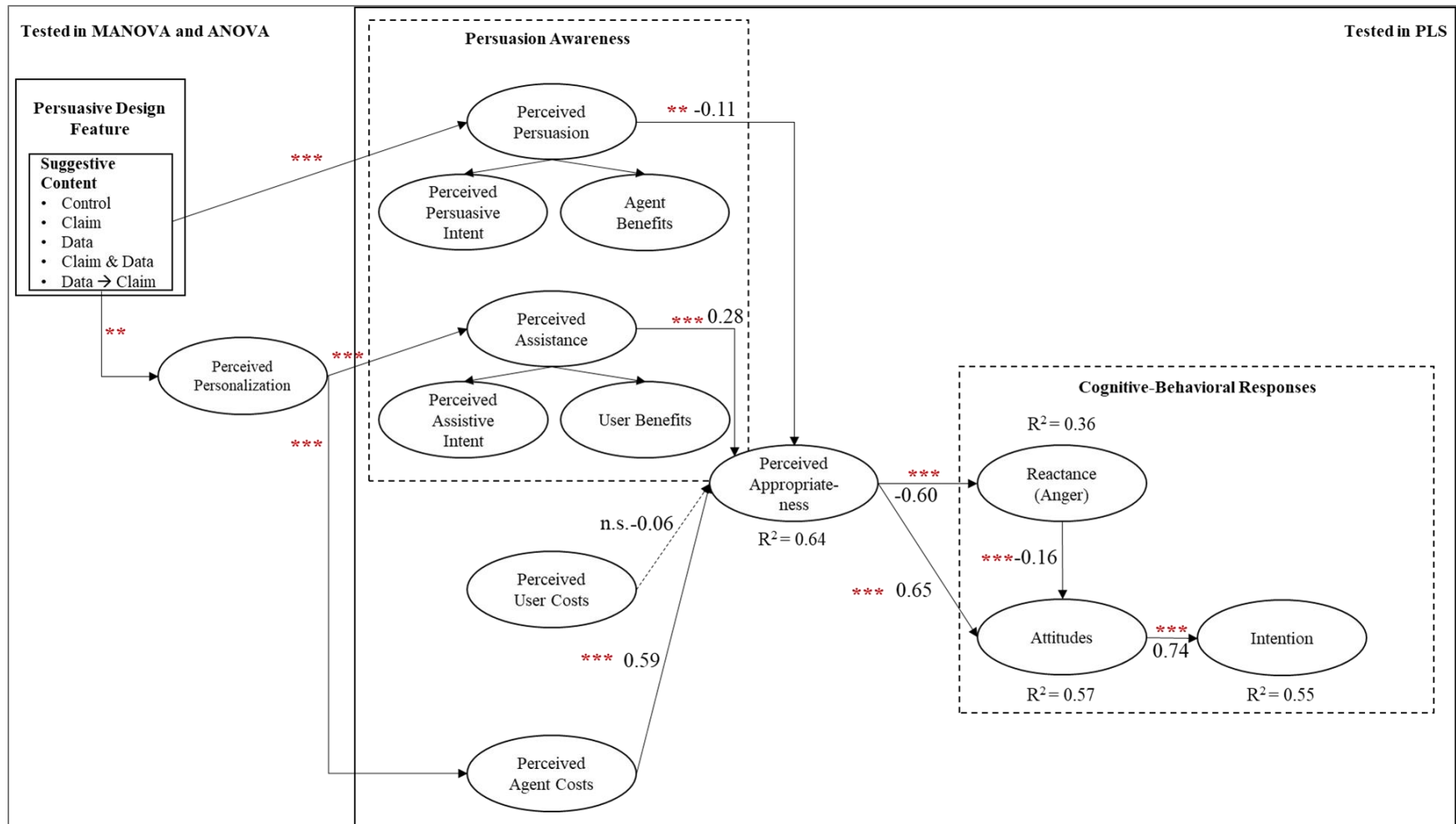
Note: * $p < .10$, ** $p < .05$, *** $p < .001$, n.s. $p > .1$ level, rectangles = observable constructs, ellipses = non-observable constructs

Figure 17. Structural path model in empirical study 1 with all conditions
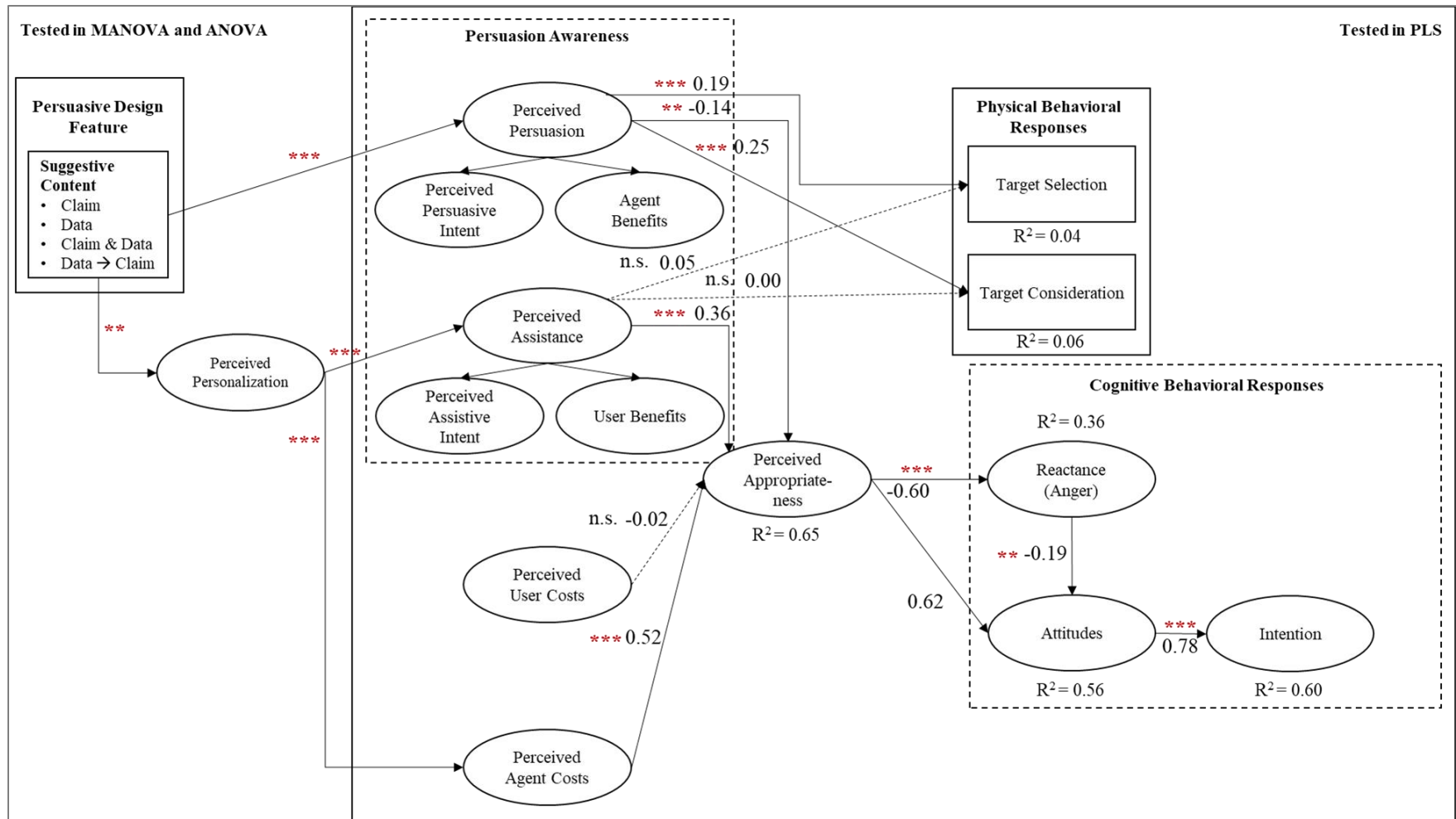
Note: * *p* < .10, ** *p* < .05, *** *p* < .001, n.s. *p* > .1 level, rectangles = observable constructs, ellipses = non-observable constructs

Figure 18. Structural path model in Empirical study 1 with treatment conditions with GA track only

4.3.7.4 Supplemental Evidence for the Impact of Persuasion Awareness on Objective Behaviors

Discriminant analysis was used to determine whether perceived persuasion and perceived assistance discriminated most strongly between those who engaged in a targeted objective behavior, targeted product selection and consideration, and those who did not. While discriminant analysis on targeted product selection showed a significant function, Wilk's $\Lambda = 0.97$, χ^2 (2) = 14.51, $p < .001$, eigenvalue was low, $\lambda = .04$, canonical correlation = .19. The discriminant function was dominated by perceived persuasion, whereas perceived assistance was not significant (see Table 52). Similarly, discriminant analysis on targeted product consideration revealed a significant function, Wilk's $\Lambda = 0.94$, χ^2 (2) = 18.96, $p < .001$, with low eigenvalue, $\lambda = .07$, canonical correlation = .25. The discriminant function was dominated by perceived persuasion, while perceived assistance was not significant (see Table 52). Overall, in line with the structural analysis, these results indicated that only perceived persuasion discriminated between those who selected/considered a targeted product and those who did not.

Effect	Wilk's Λ	F	p	Coefficient
Targeted selection				
Perceived persuasion	0.97	13.51[a]	.00	0.97
Perceived assistance	1.00	1.49[a]	.22	0.31
Targeted consideration				
Perceived persuasion	0.94	19.64[b]	.00	1.04
Perceived assistance	1.00	0.01[b]	.93	0.02

Note: [a] all treatment conditions – $F(1, 391)$, [b] treatment conditions with GA track only – $F(1, 298)$

Table 52. Discriminant analysis in empirical study 1 (treatment conditions only)

Additionally, I applied binary logistic regression to evaluate the effect of perceived persuasion and perceived assistance on objective responses. Results from logistic regression of targeted product selection demonstrated that perceived persuasion significantly predicted the probability of targeted product selected, controlling for perceived assistance. This indicated that the odds of having a targeted product selected was predicted to increase by a factor of 1.71 per a one-unit increase in perceived persuasion, controlling for perceived assistance. However, perceived assistance did not significantly predict the product selected probability, partialling out the impact of perceived persuasion. In parallel, binary logistic regression of targeted product consideration results suggested that only perceived persuasion was significantly associated with the probability of a targeted product considered. This showed that the odds of having a targeted product considered was predicted to increase by a factor of 1.69 per a one-unit increase in perceived persuasion, controlling for perceived assistance. Partialling out perceived persuasion, perceived assistance did not significantly influence the probability of a targeted product considered. These analyses echoed that perceived persuasion increased the probability of objective responses performed.

Effect	B	Wald χ^2	p	OR	95% CI	
					LL	UL
Targeted product selection						
Perceived persuasion	.54	12.40	.00	1.71	1.27	2.31
Perceived assistance	.20	1.39	.24	1.22	0.88	1.69
Targeted product consideration						
Perceived persuasion	.53	17.68	.00	1.69	1.32	2.16
Perceived assistance	.01	0.00	.95	1.01	.78	.130

Note: $N_{TargetSelection} = 393$, $N_{TargetConsideration} = 300$, OR = odds ratio, CI = confidence interval, LL = lower limit, UL = upper limit

Table 53. Binary logistic regression of targeted product selection and consideration in empirical study 1

4.3.7.5   Discussion on Persuasion Awareness and Relevant Constructs

Structural path analyses offer support for the negative impact of perceived persuasion and the positive impact of perceived assistance and agent costs on perceived appropriateness, hence supporting H1, H2, and H4. Compared with perceived assistance and agent costs, perceived persuasion has a weaker effect. However, perceived user costs do not contribute to perceived appropriateness, thus failing to support H3. Perceived appropriateness, in turn, affects cognitive responses, thus supporting H5. Specifically, it decreases reactance and increases positive attitudes towards a website. Also, reactance dampens positive attitudes. Attitudes positively shape intention to use the website. In addition, consistent with PKM, perceived persuasion influences objective responses—targeted product selection and consideration, thus supporting H6. In other words, when users feel that a website is trying to persuade them, they do not limit themselves to resist it. PKM proposes that individuals who are aware of persuasion attempts will make their own goals more salient. This will lead them to respond to the attempts in line with their goals. That is, they will elaborate on persuasion attempts even more (Friestad and Wright 1994). In line with this, they engage in careful evaluation and decision-making. That is, they check a targeted product by viewing it in more detail or adding it to their consideration set. Also, they select it if they see fit.

4.4   Conclusion

4.4.1   Summary

Table 54 presents a summary of the outcomes of hypotheses testing.

Hypotheses	Supported?
H1: Perceived persuasion of online entities will decrease perceived appropriateness of online entities that provide PDFs.	Yes

Hypotheses	Supported?
H2: Perceived assistance of online entities will increase perceived appropriateness of online entities that provide PDFs.	Yes
H3: Perceived user costs will decrease perceived appropriateness of online entities that provide PDFs.	No
H4: Perceived agent costs will increase perceived appropriateness of online entities that provide PDFs.	Yes
H5: Perceived appropriateness of online entities that provide PDFs will increase users' positively cognitive-behavioral responses.	Yes
H6: Perceived persuasion of online entities will enhance users' objective-behavioral responses.	Yes
H7: Perceived assistance of online entities will strengthen users' objective-behavioral responses.	No
H8: Online entities that provide suggestive PDFs will increase users' perceived persuasion.	Yes
H10: Online entities that provide the suggestive form of PDFs will increase users' perceived assistance.	Partially, only the presence of data increases perceived assistance.
H12: Online entities that provide the suggestive form of PDFs will increase users' perceived personalization.	Partially, only the presence of data increases perceived personalization.
H13a: For the content of the suggestive form, online entities that provide the claim-only (C) PDFs will enhance users' perceived persuasion of such entities more than those that provide the data-only (D) PDFs.	Yes
H13b: Online entities that add content(s) to a claim PDF (C + D) will not increase users' perceived persuasion of such entities.	Yes

Hypotheses	Supported?
H14a: Online entities that add data only (C + D) to the claim content will strengthen users' perceived assistance of such entities more than those that provide PDFs with claim-only (C) and data-only (D) content.	Partially, D → C increases perceived assistance, while C & D does not.
H16: Perceived personalization will enhance perceived assistance.	Yes
H17: Perceived personalization will increase perceived agent costs.	Yes

Table 54. Hypotheses testing results in empirical study 1

4.4.2 Discussion

Overall results indicate that the suggestive content, claim and data, affects users' persuasion awareness and thus behavioral responses. That is, an online entity providing claim or data content makes users aware of persuasion significantly more than one without claim or data content. However, adding data to a claim (C & D) or supporting a claim with data (D → C) does not increase perceived persuasion. This aligns with the context congruity's proposition (Cowley and Barron 2008) that a persuasion attempt that blends well with the context it is situated (i.e., product placement) will be less likely to induce perceived persuasion. In line with this, additional content blends in with existing content. Thus, adding data to a claim or supporting it does not increase perceived persuasion. Also, an online entity with data significantly strengthens users' perceived assistance, while one with a claim does not. This partly confirms Gregor and Benbasat (1999)'s assertion that users will perceive explanations (e.g., data back-up) as more persuasive, and Kim and Benbasat (2006)'s finding that users are more likely to trust arguments featuring supporting data to a claim.

In addition, this study differentiates the two forms of claim and data combination. A closer comparison between the two forms reveals that adding data to a claim (C & D) is different from

supporting it with data (D → C). In other words, a claim with data support (D → C) increases perceived assistance than the no claim – no data, while adding data to a claim (C & D) does not. Taking these findings together, I recommend that an online entity featuring a claim with data support (D → C) is the better design, as it makes users aware of persuasion and, at the same time, enhances their perception of assistance.

Consistent with personalization research's evidence for positive outcomes (e.g., Komiak and Benbasat 2006), perceived personalization is an important factor driving perceived assistance. The mediation analyses show that perceived personalization mediates the effect of data content on this perception. That is, data provision shapes perceived personalization, which, in turn, directs users' perceived assistance. As a result, personalization plays a key role in persuasion awareness.

In line with Campbell (1995), this study reveals that perceived assistance and perceived agent costs increase perceived appropriateness. Findings on perceived agent costs also echo social exchange theory, such as Tsekouras et al. (Working Paper). Specifically, when users interact with a recommendation agent (RA), they will evaluate its effort in relationship to their effort. However, inconsistent with Campbell (1995), results show that perceived persuasion decreases and perceived user costs do not shape perceived appropriateness. The conceptualization of perceived persuasion would be one possible explanation for the negative effect of perceived persuasion. Unlike this study, her study focuses more on agent benefits and does not consider perceived persuasive intent. As previously noted, perceived persuasive intent and perceived agent benefits are correlated. However, perceived persuasive intent does not guarantee the other. In other words, if users feel that an online agent is trying to persuade them, they will *or* will not benefit from such attempt. Thus, to better capture perceived persuasion, both dimensions should be considered. A possible

explanation for no impact of perceived user costs would be the fact that the costs (e.g., cognitive effort) engaged in reading suggestive content are minimal, compared with the costs associated with ad consumption in her study. Therefore, no significant impact of perceived user costs is found in this study. Perceived appropriateness, in turn, influences cognitive responses, such as reactance, attitudes towards an online entity, and intention to use an online entity. Compared with perceived assistance and agent costs, perceived persuasion has a weaker impact on perceived appropriateness. However, only perceived persuasion shapes physical responses, such as targeted product selection and consideration. This supports PKM (Friestad and Wright 1994) such that perceived persuasion triggers physical responses, such as targeted product selection and consideration in the current study. Specifically, when users are aware of persuasion, they will be more likely to perform careful scrutiny. Thus, with perceived persuasion, they check a targeted product more. If they find it fits their preferences, they will be more likely to select it. This suggests that they will engage in more careful evaluation and decision-making. Therefore, perceived persuasion is an important factor, as it influences both cognitive and physical responses.

In sum, experiment 1 and 2 give evidence that the suggestive content can shape users' persuasion awareness such that an online entity that provides data to support a claim (D → C) does not induce users to be aware of persuasion more, but stimulates more perceived assistance, than one with claim-only content (C). Thus, users provided with a claim and data support (D → C) interpret the design of such entity as more appropriate and thereby develop positive cognitive responses more. However, supporting a claim with data (D → C) does not increase perceived persuasion that contributes to careful evaluation and decision-making. As a result, this does not increase physical responses more than the claim-only (C).

4.4.3 Theoretical and Practical Contributions

4.4.3.1 Theoretical Contributions

The theoretical contributions of this study are three-fold. Firstly, this study systematically evaluates persuasion awareness in an online setting, such as e-commerce. Although IS scholars have touched on this topic, they do not systematically explain how and why persuasion awareness takes place. For instance, Yi et al. (2019) studied how firm-highlighted review influenced users' attention and intention. They referred to promotional intent in their study and evaluated the effect of review on users' skepticism. Specifically, they found that the review drove users' skepticism about it. However, they did not focus on how promotional intent, which aligns with my perceived persuasive intent, affected users' skepticism, which is one type of cognitive responses in my study. In this manner, it lacks evidence for the antecedents and consequences of persuasion awareness, as well as for its mechanisms. Consequently, I empirically examine the impact of one antecedent, namely the suggestive content, drawing from Toulmin (1958), on persuasion awareness. This antecedent has a wide range of application and can be found in the real online platforms.

Also, this study applies Friestad and Wright (1994)'s PKM to explain how the suggestive content shapes persuasion awareness and its consequence. Unlike the majority of PKM and persuasion awareness research, this study integrates relevant constructs to help explain the underlying mechanisms of persuasion awareness in an e-commerce context. This study extends the PKM's emphasis on the role of persuasion knowledge by examining a technological determinant, the suggestive content attached to the targeted product. Also, to better capture the outcomes of persuasion awareness, I draw from equity theory (Campbell 1995) and add perceived user costs and agent costs. My findings indicate that only perceived agent costs influence a subsequent

outcome, called perceived appropriateness. This might result from the fact that user costs associated in reading the suggestive content in this current study is minimal, compared with their costs associated with ad consumption in Campbell (1995). Next, it includes perceived personalization to help illustrate how the suggestive content induces persuasion awareness through perceived assistance and agent costs. The mediation analyses reveal that the suggestive content, specifically data content, positively influences perceived personalization, which, in turn, increases perceived assistance and agent costs. In sum, this study provides concrete support for the impact of the suggestive content on persuasion awareness and the underlying mechanisms. Hence, this study provides better picture of persuasion awareness in this particular setting.

Secondly, to the best of my knowledge, this study is the first research in IS that implements Toulmin (1958)'s argument content to enable persuasion in an online setting in the form of suggestive content, and evaluates its impact on persuasion awareness and behavioral responses based on PKM. According to Toulmin (1958), the main argument elements are a claim and data. I utilize these two individual content elements and their combinations to design the suggestive content and systematically explain how different contents shape users' persuasion awareness and responses. This study informs that argument content can be designed to trigger persuasion and shape persuasion awareness, perceived personalization, and further behavioral responses. Although IS scholars have extensively examined the role of Toulmin (1958)'s argument content in persuasion, their research is less likely to investigate its effect on persuasion awareness. For example, Kim and Benbasat (2006) examine the impact of the argument content on online consumers' trusting beliefs. Thus, this current study serves as a stepping stone to understand how suggestive content can be developed based on Toulmin (1958) and influence users' persuasion awareness and subsequent responses.

Thirdly, this study speaks to Toulmin (1958)'s model of argument. Specifically, it provides evidence that the construction of claim and data content combination matters. While prior research (e.g., Fox and Modgil 2006; Kim and Benbasat 2006) has studied multiple argument elements (e.g., a claim, data, backing, and warrant) and their combinations, it does not explicitly differentiate between a claim and data, and among different constructions of content combinations. In the field, a single data element is widely used. For instance, Amazon.com attaches "Bestseller" to the targeted product without stating a claim. In this case, only data is given without a claim. This does not conform to the traditional research adopting Toulmin (1958) that requires data as a ground for a claim.

Additionally, online entities sometimes give more than one suggestive content to the targeted item. For example, Booking.com attaches "Great value today" and "In high demand – only 5 rooms left" to one hotel without giving a clear link between the two contents. As another instance, Netflix lists movies as "Top pick for [username]" together with "[percentage]% match without a connection between these two suggestive content elements. On the contrary, some online platforms state a clear connection between a claim and data. For instance, Instagram provides users with the following suggestive content, "Since you follow [username], you might like [username]." In the former case, an online entity adds data (e.g., "only 5 rooms left," "[percentage]% match") to a claim (e.g., "Great value today," "Top pick for [username]"). In the latter case, an online entity clearly supports a claim (e.g., "you might like [username]") with data (e.g., "you follow [username]"). While adding data to a claim (C & D) could be viewed as two pieces of suggestive content, supporting a claim with data (D → C) clearly reflects one piece of suggestive content. It also aligns with the explanation facility discussed in Wang and Benbasat (2007). Thus, a connection between a claim and data helps explain the suggestive content to users. The findings

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from this current study reveal that users perceive the two forms of combination differently. In the claim-and-data (C & D) combination, users do not increase their perceived assistance. In contrast, users in the data-supporting-claim (D → C) combination perceive that an online entity is more assistive than the control condition. In this way, this study has provided support to extant research on the superior effect of adding an argument element to support a claim (Kim and Benbasat 2006). This also sheds light on the role of content combination construction in assisting users' product evaluation and decision-making.

Thirdly, this study provides empirical support to the proposition of PKM that reactance is not always the answer for persuasion awareness. In other words, individuals who are aware of persuasion attempts do not limit themselves to reactance to such attempts. PKM proposes that they can engage in the careful evaluation of such attempts. Nevertheless, most persuasion awareness studies have focused more on cognitive responses, such as attitudes and intentions. Thus, concrete evidence to support the PKM's proposition has received little attention. To this end, I empirically test it in this study. Using GA tracking functionality, I observe how users make product evaluations and decisions. Results suggest that users who are aware of persuasion are more likely to evaluate the targeted product more than those who are not. This also translates to their product selection. That is, those who are aware of persuasion end up with the targeted product more than those who are not. This lends some support to the PKM's proposition that those who are aware of persuasion will engage in informed evaluations and decisions not just by simply skipping the targeted option in the presence of the suggestive content.

4.4.3.2   Practical Contributions

Overall, the results of this study have provided concrete guidelines in designing an e-commerce website and other online entities to persuade users in such a way that they are aware of being persuaded and assisted by online platforms at the same time. Since supporting a claim with data content demonstrates such characteristics, I propose that the use of the data-supporting-claim content (D $\rightarrow$ C) appears a better design choice than the use of claim-only (C), data-only (D), or claim-and-data (C & D).

In conclusion, this study has provided an effective design, the suggestive content, to enable persuasion in the e-commerce context and also theoretical explanations regarding how such design stimulates users' persuasion awareness and thereby behavioral responses.

4.4.4   Limitations

As discussed in 3.2.2.2 in the previous chapter, there are many different claim and data content manipulations. In this current study, two claim manipulations ("Buy this item" and "We recommend this"), two data manipulations ("Best-selling item" and "Low in stock"), and two claim-data combinations ("Best-selling item. We recommend this." and "Since this is best-selling, we recommend this.") are investigated. However, supplemental analyses in Appendix J suggest that the same type of content does not work the same. For example, "We recommend this" is more suggestive and better fits with claim content than "Buy this item." This is also the case for "Best-selling item" and "Low in stock." Thus, it should be noted that different manipulations of the same type of content can yield differences in its influence. Nevertheless, the overall findings lend support to the main effect of claim and data content. Also, only the superior contents were used in

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the combinations in this study. It is possible that if data content is added to the low suggestive claim, "Buy this item," its influence effectiveness may be strengthened.

In addition, the context in which the suggestive content is manifested would affect the generalizability of this study. First, there is only one product used in the experiment. As product type such as experience-search can influence users' information processing (Huang et al. 2009; Weathers et al. 2007), task products might affect users' persuasion awareness. My task product is a search product according to the task product pretest (see Appendix E E.1). Thus, the findings are most appropriately generalizable to the e-commerce website for the search product. However, extant research found that consumers relied on the product presentation (e.g., pictures) more for the experience product than for the search one (Weathers et al. 2007). Following this, if the suggestive content works for the search product, it will be appliable for the experience type for which users are more likely to rely on an additional cue. As a result, I believe that my findings can be generalizable to the website for the experience product as well. Secondly, this particular study limits to desktop users and excludes mobile users. As Lee and Benbasat (2010) found, mobile and desktop users adopt different product evaluation and decision strategies. Therefore, my findings' generalizability might limit to desktop users. Like the product type of a task product, the larger screen size of a desktop computer serves as a more stringent testing environment. As ELM notes, if individuals' cognitive capacity is limited, they will rely more on peripheral cues. The proposed suggestive content works as a peripheral cue. Also, cognitive capacity plays a role in persuasion awareness (e.g., Campbell and Kirmani 2000). Thus, the device or screen size can moderate the effect of the suggestive content. Therefore, it is possible that the effect of the suggestive content for mobile users will be more pronounced.

4.4.5　Future Research

This study has examined the effect of the suggestive content, claim, data, and their combinations, on users' persuasion awareness and behavioral responses. There are two manifestations of claim and data content. As noted in the previous section, not all claim and data contents are equal. For instance, "Buy this item" is different from "We recommend this" in terms of speech acts (Searle 1975). Speech act theory argues that "speaking a language is performing speech acts, acts such as making statements, giving commands, asking questions, making promises, and so on" (Searle 1969, p. 16). Based on the five purposes of speaking, Searle (1979) proposes five general ways of using language or speech acts: 1) assertive—"we tell people how things are," 2) directives—"we try to get them to do things," 3) commissive—"we commit ourselves to doing things," 4) expressive—"we express out feelings and attitudes," and 5) declarations—"we bring about changes in the world through our utterances" (p. viii). Speech act theory has been used to develop IT systems, such as recommendation agents (RAs). For instance, Al-Natour et al. (2006) manipulated the dominance personality of RAs based on suggestive guidance and directives. They found that individuals with dominance personality perceived high similarity between RAs and themselves when RAs were highly suggestive and used directives, while those with submissive characteristics perceived high similarity between themselves and RAs with less suggestive and assertive. This study points out that speech acts can be embedded in IT, such as RAs. Thus, speech acts are applicable to design a claim and data content. In this study, "Buy this item" and "We recommend this" align with the directive speech act, while "Best-selling item" and "Low in stock" are in line with the assertive one. The future research may interest in evaluating the effect of different claim and data contents based on speech acts: 1) "Buy this item" and "We recommend this" representing a directive act, 2) "Best-selling item" and "Low in stock" reflecting an assertive

act, 3) "How nice this is!" showing an expressive act, and 4) "While others give a two-year warranty, we give you five years!" for a declarative act. Also, it is interesting to assess other elements of Toulmin (1958), such as backing and warrant, as well as their combinations.

Additionally, it may be interesting to investigate how the target placement impacts users' behaviors, such as targeted product selection and consideration. Prior research has illustrated that there are primacy and recency effect of messages on persuasion (Miller and Campbell 1959). Preliminary results from supplemental analyses in Appendix K K.4 reveal that the targeted product placement (row) affects the targeted product selection. That is, the target placed in row 5 is less likely to be selected/considered than that in row 2, whereas there is no difference in the selection/consideration between that in row 2 and row 5. This provides some support to primacy and recency effect. The future research should investigate this in more detail.

In general, no evidence of the relationship between perceived assistance and objective responses is found. Perceived personalization has a strong influence on perceived assistance. However, in this study, I measure perceived personalization without manipulating the mode of personalization. As a result, it would be interesting to examine whether the mode of personalization can provoke more perceived assistance and also agent costs that strongly shape subsequent perceptions and responses. If so, it will justify my proposed theoretical model described in the previous chapter even further.

Moreover, the invocation style—automatic and on-demand—is predicted to influence perceived persuasion and user costs in the previous chapter. Specifically, the on-demand style features a button that requires users to click on the button to see the suggestive content (claim or data content), while the automatic style does not feature that button. The preliminary results of the

measurement pretest reveal that no significant effect of the invocation style was found. See E.2 for more detail. As a result, future studies may want to explore the effect of invocation style.

Also, the current study does not implement a supportive PDF, such as sort and filter, that is a ubiquitous feature on e-commerce website. The supportive PDF is hypothesized to increase users' cognitive capacity and thus make them aware of persuasion even more. It would, thus, be interesting to assess the moderating role of a supportive PDF. This also helps reflect ecological validity even more.

Although I recommend that the data-supporting-claim content works best, this design does not increase or decrease perceived persuasion. Due to its importance to careful scrutiny, perceived persuasion needs to be amplified. In the next chapter, transparency mechanisms promoting perceived persuasion are developed and examined. These mechanisms will encourage users to perform informed judgment and decision-making.

Chapter 5: Investigating the Role of Persuasion Transparency Information in Enhancing Online Users' Persuasion Awareness

5.1 Overview

This chapter sets out to empirically investigate the effect of suggestive content, together with persuasion transparency information, on online users' persuasion awareness. Persuasion transparency information discloses persuasion tactics employed by an online entity. While empirical study 1 (Chapter 4) examines the effect of suggestive content on users' persuasion awareness and behavioral responses, this empirical study adds persuasion transparency information and aims to test its impact together with the suggestive content on persuasion awareness. In other words, this chapter investigates whether adding information regarding persuasion tactics that appeared on an online entity will enhance persuasion awareness. Consequently, I examine the following hypotheses developed in Chapter 3: section 3.3:

H8: Online entities that provide suggestive PDFs will increase users' perceived persuasion.

H10: Online entities that provide the suggestive form of PDFs will increase users' perceived assistance.

H12: Online entities that provide the suggestive form of PDFs will increase users' perceived personalization.

H16: Perceived personalization will enhance perceived assistance.

H21a: Persuasion transparency will increase users' perceived persuasion.

H22a: Persuasion transparency will decrease users' perceived assistance.

I test the above hypotheses in an online experiment in the context of e-commerce. I collected two batches of data. In the first batch, the scale for manipulation check for persuasion transparency information had low reliability. Accordingly, I adjusted the two items of this scale in the second batch to improve the reliability of the scale. Figure 19 presents the research model examined in this chapter. Prior to the experiment, two pretests using online experiments were conducted. See Appendix L L.1 and L.2 for more detail. The two pretests provide preliminary evidence that suggestive content and persuasion transparency information affect perceived assistance and perceived persuasion.

In the current online experiment, I evaluate four suggestive content conditions: 1) content control (no suggestive content), 2) "We recommend this," 3) "Best-selling item," and 4) "Low in stock." Together with the four suggestive content conditions, I assess three levels of persuasion transparency information: 1) no information, 2) non-persuasion information (placebo), and 3) persuasion transparency. Thus, this empirical study investigates the impact of suggestive content and persuasion transparency information manipulation on perceived persuasion and perceived assistance.

I pooled data from two batches of the online experiment. Results relatively replicate the impact of suggestive content on perceived persuasion and perceived assistance found in Chapter 4: empirical study 1. The suggestive content increases perceived persuasion, as well as perceived assistance. In particular, providing users with "We recommend this" and "Best-selling item" increases the perceived persuasion of an online entity. However, providing them with "Low in stock" does not. Contrary to my prediction, persuasion transparency information does not increase perceived persuasion. In other words, an online entity disclosing persuasion transparency information does

not enhance users' perceived persuasion of such an entity. Nonetheless, the results from a structural model of persuasion awareness using perceived suggestive design, a proxy of suggestive content, and perceived availability of persuasion transparency, a surrogate for persuasion transparency information, as independent variables demonstrate otherwise. As the two perceptual measures serve as manipulation checks for the suggestive content and persuasion transparency information, they can be used to evaluate their effects on persuasion awareness. It appears that perceived availability of persuasion transparency, in addition to perceived suggestive design, fortifies perceived persuasion. Thus, persuasion transparency information enhances users' perceived persuasion.

In addition, the experiment shows that suggestive content, "We recommend this," increases perceived assistance through perceived personalization. Also, persuasion transparency information decreases perceived assistance beliefs after controlling for perceived personalization. This means that users who receive persuasion transparency information feel that they have received less assistance from an entity, regardless of the presence of suggestive content. As a result, the presence of persuasion transparency information can create false alarms for those who do not encounter suggestive content and reveal the real intent of an online entity for those who see such content.

In conclusion, suggestive content has an impact on persuasive persuasion and perceived assistance. Users have higher perceived persuasion of an online entity when seeing "We recommend this" and "Best-selling item." On the other hand, users do not have higher perceived persuasion of an entity when "Low in stock" is given. Also, "We recommend this" strengthens users' perceived assistance belief. With persuasion transparency information, users' perceived assistance decreases. This suggests that when users learn about persuasion tactics, they perceive getting less assistance from

an online entity. In other words, persuasion transparency information discloses the real intent of an online entity that provides suggestive content. This reduces users' perceived assistance of such entity for all users. Without persuasion transparency information, they perceive higher assistance from the entity. When transparency information comes into play, users who do not see the suggestive content suspect about the entity's assistance. Similarly, those who receive the suggestive content perceive less assistance of the entity. Therefore, this empirical study provides additional support to the influence of suggestive content on perceived persuasion and perceived assistance. Also, this study offers initial evidence for the impact of persuasion transparency information on perceived persuasion and perceived assistance.
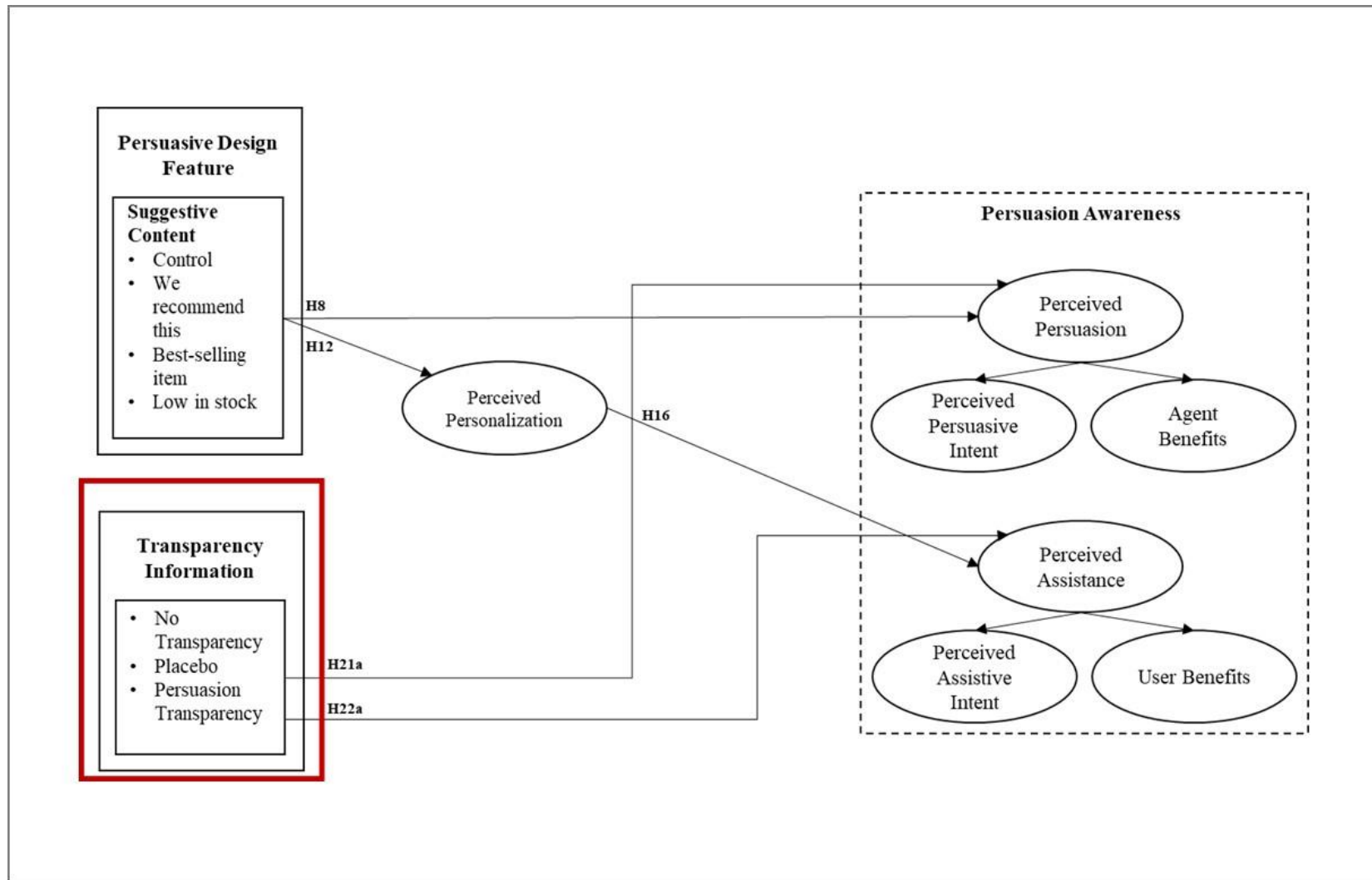
Note: Rectangles – observable constructs, ellipses – non-observable constructs, red box – a new construct tested in this study

Figure 19. Research model tested in empirical study 2

5.2 Research Method

I conducted an online experiment having a 4 (suggestive content) x 3 (persuasion transparency information) between-subjects design. I utilized three levels of persuasion transparency information, two of which serve as control design. No information is the baseline. Non-persuasion information required participants to read something not relevant to persuasion tactics, that is, another control. This design helps control the effect of cognitive capacity. As prior research found, individuals whose cognitive capacity is limited are less likely to detect persuasion attempts (e.g., Campbell and Kirmani 2000), participants who read information before exposing to suggestive content might have less cognitive capacity than those who did not read. Therefore, if there is no difference in persuasion awareness between non-persuasion information and no information, cognitive capacity might not be a confound. The manipulations are presented in Table 55.

Suggestive Content	Persuasion Transparency Information		
	No Information	Non-Persuasion Information	Persuasion Transparency
Content control	Condition 1	Condition 2	Condition 3
We recommend this	Condition 4	Condition 5	Condition 6
Best-selling item	Condition 7	Condition 8	Condition 9
Low in stock	Condition 10	Condition 11	Condition 12

Table 55. Suggestive content and persuasion transparency information manipulations in empirical study 2

5.2.1 Persuasion Transparency Information Design

This study also uses an experimental website, called Home Appliance Group (homeappliancegroup.com), that was used in experiment 1 of empirical study 1. Suggestive content is attached to the second product from the left in row 2 (6th of 40 products, see Figure 20). Also, I add an "about page" in this study (see Figure 21 – Figure 23). The about page is for

persuasion transparency information manipulation. After participants logged in to the website, they were redirected to the about page. After they read the about page, they were asked to go to the shopping page. For all conditions, the about page stated that users have successfully logged in and asked them to go to the shop page. For no information, no additional information was given on the about page (Figure 21). For non-persuasion information, information regarding a city where the university is located was provided (Figure 22).
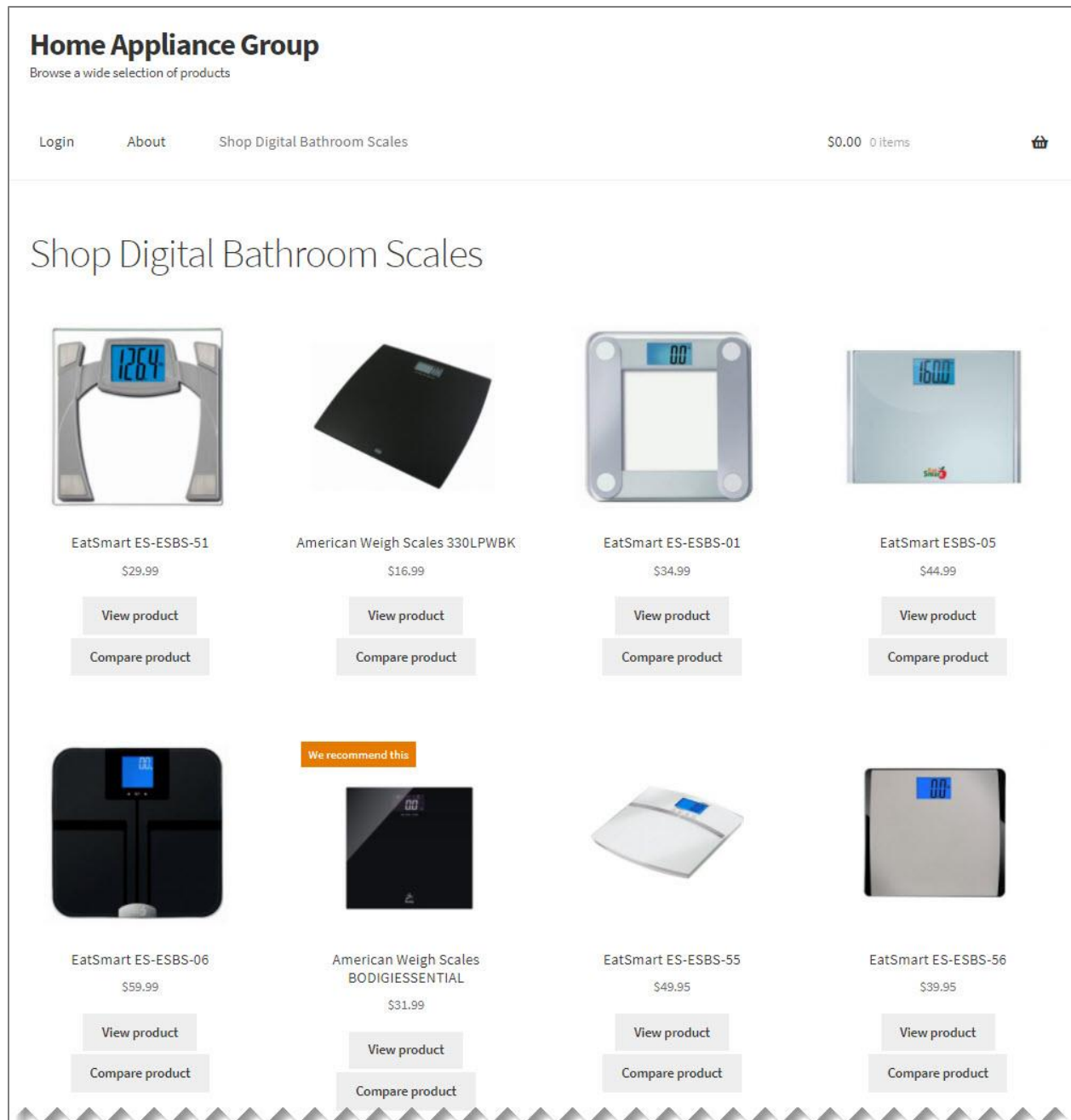
Figure 20. A screenshot of "We recommend this" on the shop page in empirical study 1
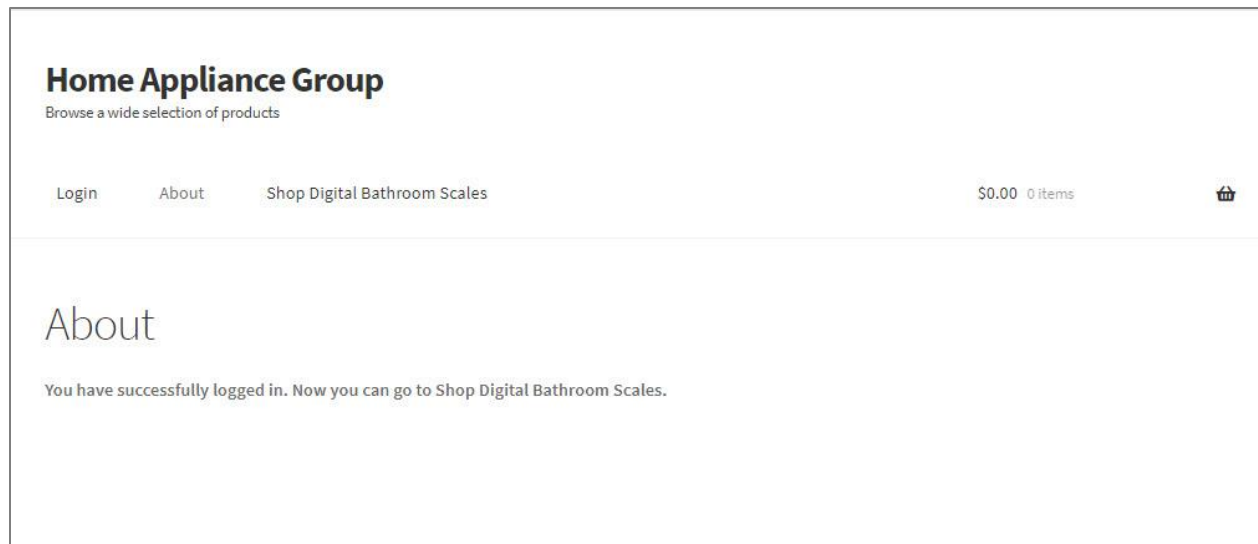
Figure 21. A screenshot of no information on the about page in empirical study 2
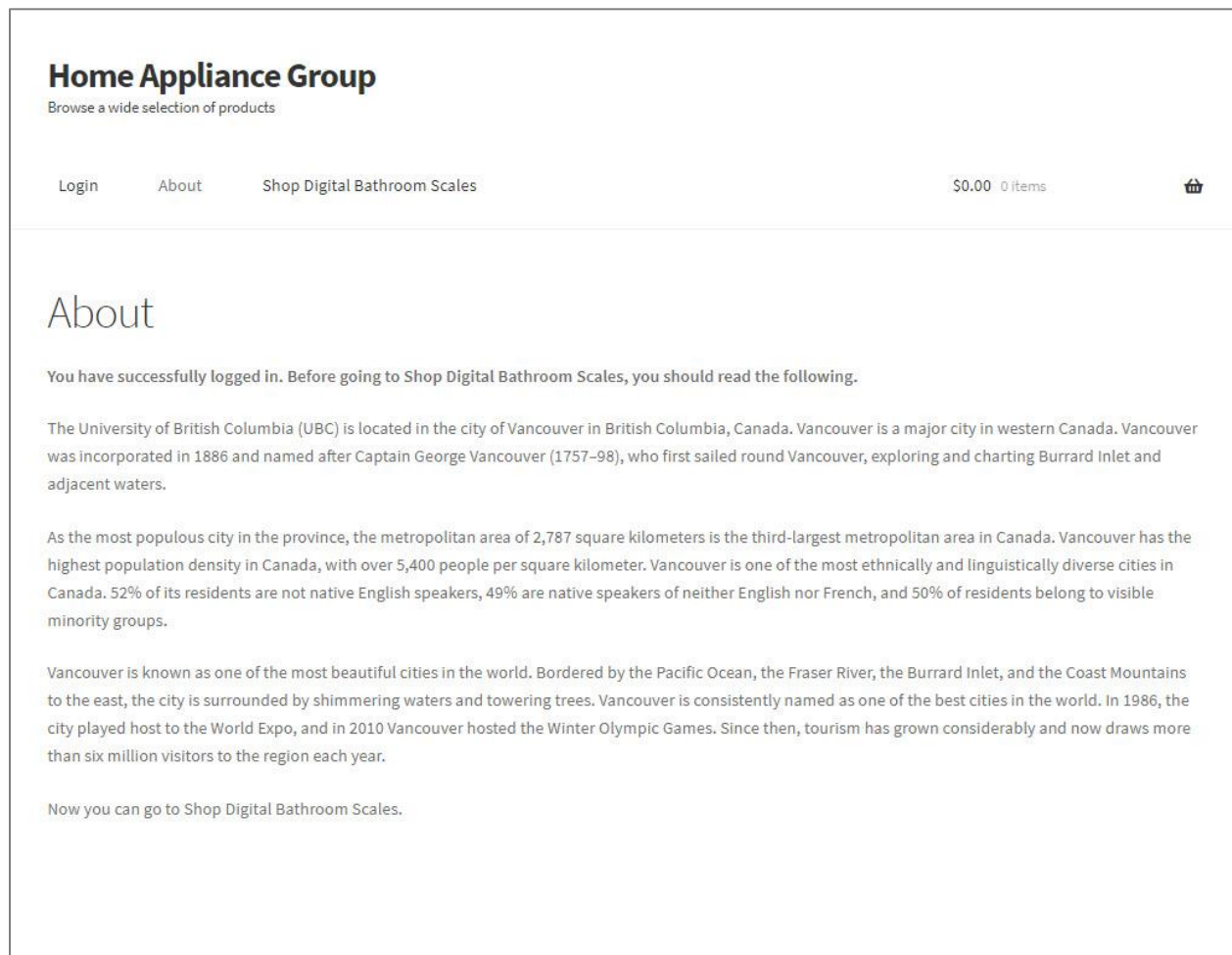
Figure 22. A screenshot of non-persuasion information on the about page in empirical study 2

To design persuasion transparency information, I followed Williams et al. (2004). They asked participants to read a research abstract about the mere-measure effect presented as an abstract from the *Journal of Consumer Research*. In line with this, my persuasion transparency information features the persuasion tactics that correspond to the three suggestive contents I implemented in this study. Drawing from Cialdini (1983)'s influence tactics, I adopted the three rules described in Table 56. The first tactic refers to reciprocity. When an online entity recommends products to its users, they would feel that such entity has done them a favor by providing valuable information. Accordingly, they would feel grateful and accept those recommended products. As the second tactic, bestsellers indicate what many consumers buy. This suggests social proof. That is, users would feel that how many others can be wrong. The third tactic is scarcity. Products with low inventory would make users fear missing out on these products.

Suggestive Content	Persuasion Tactic (Cialdini 1983)	Definition
We recommend this	Reciprocity	Individuals tend to repay, in kind, what others have provided them.
Best-selling item	Social proof	Individuals determine what is correct based on what others think is correct.
Low in stock	Scarcity	Things are perceived to be more valuable to individuals when their availability is limited.

Table 56. Three persuasion tactics used in empirical study 2

In addition to persuasion tactics, I follow Xiao and Benbasat (2015) to warn users that there is a risk associated with suggestive content. That is, the product with suggestive content might not be the one they want. For the reciprocity tactic, users are warned that the product recommendations might not be their best fit if their tastes differ from what an online entity knows. For the social

proof tactic, users are reminded that if they are not similar to many others, they might not like the best-sellers. In terms of the scarcity tactic, users are warned that the product with low inventory might not be a thing they want. Unlike Williams et al. (2004)'s mere-measure effect that aims at influencing individuals without helping them, the three persuasion tactics are neutral. Thus, suggestive content can lead to either perceived persuasion or assistance, or both. In this case, adding warning messages to persuasion transparency aims to educate users about persuasion tactics, as well as a risk associated with suggestive content. As a result, I developed a set of persuasion transparency information. See Figure 23 for more details.
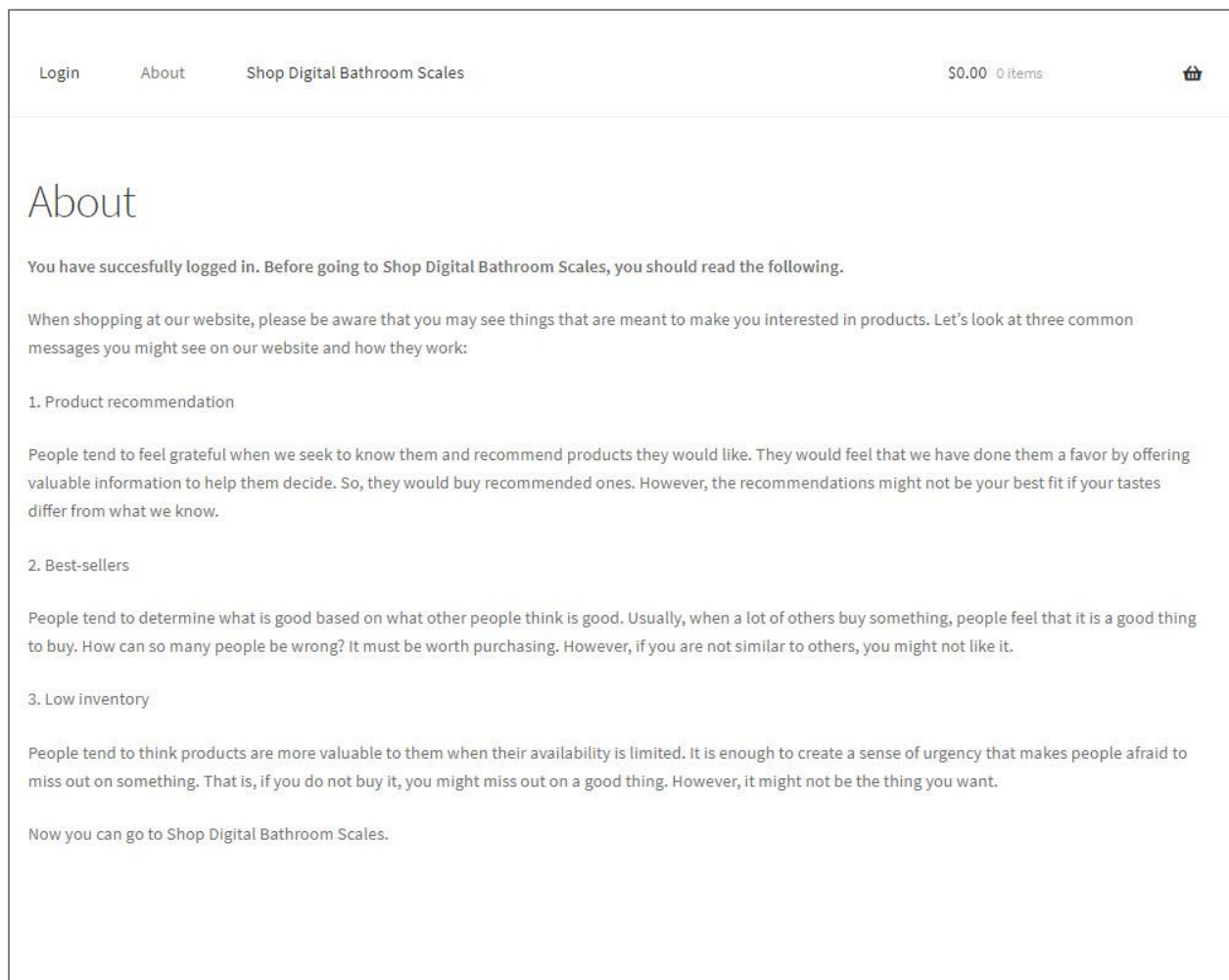
Figure 23. A screenshot of persuasion transparency on the about page in empirical study 2

5.2.2 Experimental Procedures and Measurement

According to the power analysis for between-subjects design with one covariate (effect size $f = 0.25$, $\alpha = 0.05$, $1 - \beta = 0.80$, numerator $df = 6$, number of groups = 12, number of covariates = 1 for perceived personalization) using G*Power program (Faul et al. 2007), 225 participants were recommended for both batches of the online experiment, to assure sufficient statistical power of 0.80 for a medium effect size (Cohen 1988). In the first batch, I recruited 240 participants from Prolific (20 participants per experimental condition). To compensate for approximately 84% usable sample based on previous experiments, I recruited 268 from Prolific for the second batch. In both batches, participants were randomly assigned to one of the twelve experimental conditions (Table 55).

I followed the experimental procedures employed and measurement in empirical study 1 (see 4.2.2 for the procedures and 4.2.3 for measurement). The same pre-questionnaire survey was employed. For the post-questionnaire survey, I used the following measures used in empirical study 1— manipulation check for perceived suggestive design, perceived personalization, perceived persuasion, perceived assistance, and user knowledge. In addition, I added the following scales described next to the post-questionnaire survey:

5.2.2.1 Perceived Availability of Persuasion Transparency Information

As a manipulation check for persuasion transparency information, I developed the scale for perceived availability of persuasion transparency information using a seven-point semantic differential scale. Table 57 presents the scale items used in experiment 1. However, the Cronbach's alpha for the Perceived Availability of Persuasion Transparency Information scale in batch 1 was 0.31. Only APT2 tapped on to persuasion tactics. Therefore, I adjusted APT1 and APT3_R for

batch 2. Table 58 details the scale items used in batch 2. However, the Cronbach's alpha for the updated scale in batch 2 was 0.50, suggesting low internal consistency reliability. As a result, only APT2 was used to evaluate the effectiveness of persuasion transparency *manipulation* in this empirical study.

Item Name	Item	Scale/Source
Please evaluate [agent name] in the following aspects:		Seven-point semantic differential scale
Perceived availability of persuasion transparency information		
APT1	I did not learn about how specific things appeared on ... work. – I learned about how specific things appeared on ... work.	Newly developed
APT2	I did not learn that ... applies some gimmicks. – I learned that ... applies some gimmicks.	Newly developed
APT3_R	I learned about common things ... features. – I did not learn about common things ... features. (R)	Newly developed

Note: R = reversed item

Table 57. Measurement for persuasion transparency information manipulation check in batch 1 of empirical study 2

Item Name	Item	Scale/Source
Please evaluate [agent name] in the following aspects:		Seven-point semantic differential scale
Perceived availability of persuasion transparency information		
APT1	I did not learn about how specific tactics appeared on ... work. – I learned about how specific tactics appeared on ... work.	Newly developed

Item Name	Item	Scale/Source
APT2	I did not learn that ... applies some gimmicks. – I learned that ... applies some gimmicks.	Newly developed
APT3_R	I learned about actions ... performs. – I did not learn about actions ... performs. (R)	Newly developed

Note: R = reversed item

Table 58. Measurement for persuasion transparency information manipulation check in batch 2 of empirical study 2

5.2.2.2   Perceived Persuasion Tactic Knowledge

In addition to the previous open-ended question, I captured their knowledge about their given suggestive content using the scale from Boush et al. (1994) for participants assigned to the three suggestive content treatments. See Table 59 for detail.

Item Name	Item	Scale/Source
When [agent name] showed [persuasion tactic], how hard was it trying to do the following:		1 = not hard at all to 7 = extremely hard
Knowledge about a persuasion tactic		
PTK1	... to grab your attention?	Boush et al. (1994)
PTK2	… to help you to learn about the product?	Boush et al. (1994)
PTK3	... to make you like the product?	Boush et al. (1994)

Note: R = reversed item

Table 59. Measurement for persuasion perceived persuasion tactic knowledge in empirical study 2

5.3   Data Analyses

5.3.1   Participant Background Information

The 507 participants were recruited from Prolific ($N_{Experiment1}$ = 240, $N_{Experiment2}$ = 268). Two participants who did not finish the post-questionnaire survey and six participants who did not use a correct username (unable to track their pre-questionnaire survey) were removed from the study. Also, those who used a mobile device, added more than one product to a cart, spent less than 60

seconds on the website, and/or failed the attention check questions were excluded from analyses, resulting in 449 total usable participants from the two experiments ($N_{Experiment1}$ = 209, $N_{Experiment2}$ = 240). Additional data from Google Analytics (GA) were used to evaluate objective responses such as page scroll depth. GA data were available for those who used non-private (non-incognito) browsing mode only. There were 333 participants with usable GA data ($N_{Experiment1}$ = 152, $N_{Experiment2}$ = 181). Chi-square tests were performed to assess any difference in all exclusion criteria across all twelve experimental conditions. No significant differences were found. See Appendix M Table 195 for details regarding the participant analyses.

Chi-square tests were conducted to assess the differences in participants' demographics among the twelve experimental conditions. The statistics are reported in Table 60. Results showed that there were no significant differences in age, marital status, and gender, a significant difference in education, and a marginally significant difference in income across the twelve conditions. However, these had cells (at least 50%) having an expected count of less than 5. Thus, the interpretation of demographics differences results should take this into account. Although there were a significant association between the condition and education, the association strength was relatively weak, Cramer's V = .18, and a significant relationship between the condition and the income, their relationship strength was relatively weak, Cramer's V = .17. Also, follow-up Z-tests using a Bonferroni correction revealed that there were no significant differences between the conditions in terms of their education and income, p > .05. The education and income did not influence any constructs. Thus, there were excluded from further analyses.

Measure	χ^2	df	p
Age	60.58[a]	55	.28

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Measure	χ^2	df	p
Marital status	37.41[a]	44	.75
Education	101.41[a]	77	.03
Gender	52.73[a]	55	.56
Income	94.01[a]	77	.09

Note: [a] At least 50% of cells have expected count less than 5

Table 60. Chi-square tests comparing the twelve conditions in terms of demographics in empirical study 2

Moreover, there were no significant differences in online search frequency, online shopping frequency, and past purchase of a bathroom scale among the twelve conditions (see Table 61). Therefore, participants across all twelve conditions did not differ in terms of online search and shopping experience, as well as past bathroom scale purchase experience.

Measure	χ^2	df	p
Search frequency	81.71[a]	88	.67
Online shopping frequency	91.43[b]	88	.38
Past bathroom scale purchase	5.11	11	.93

Note: [a] 96 cells (88.90%) have expected count less than 5, [b] 83 cells (76.90%) have expected count less than 5

Table 61. Chi-square tests comparing the twelve conditions in terms of user experiences in empirical study 2

In the following analyses, I computed the score for each construct by averaging the scale items, unless otherwise stated.

5.3.2   Results on Control Variables

Table 62 presents one-way ANOVA results for the control variables. User pre-existing knowledge was controlled. A two-way ANOVA with suggestive content, transparency information, and their interaction, was conducted to evaluate the difference in three types of knowledge across the conditions. Results revealed that there were no significant differences in agent domain (e-

commerce) knowledge with a small effect size, general persuasion knowledge with a small effect size, topic (product) knowledge with a small effect size. Thus, participants did not differ in terms of their existing knowledge.

As Persuasion Knowledge Model (PKM) posits, cognitive capacity influences persuasion awareness. That is, those with higher cognitive capacity are more likely to detect persuasion attempts than those with lower cognitive capacity (Campbell and Kirmani 2000; Williams et al. 2004). I analyzed the time all users spent on the "about" page (no information, non-persuasion information, and persuasion transparency included). If users spend more time reading the about page, they will have less cognitive capacity in evaluating product alternatives on the shop page and make their product decision. A two-way ANOVA showed that there was no significant difference across the suggestive content and the persuasion transparency information conditions. Thus, users' cognitive capacity for their decision task should not affect their subsequent perceptions and behaviors.

Also, a Chi-square test on page scroll depth percentage was applied. The page scroll depth indicates how many product alternatives were seen by participants. Results showed that no significant difference in the page scroll depth percentage was found, $\chi^2(11) = 16.53$, $p = .12$. 50% of cells have expected count less than 5. Thus, results should be interpreted with caution. Approximately 93% of participants with GA track scrolled 100% and about 7% with GA track scrolled 75% of the page. This implied that a targeted product in row 2 was seen by all participants.

Measure	Suggestive Content			Transparency Information			Suggestive Content x Transparency Information		
	$F(3, 437)$	p	η_p^2	$F(2, 437)$	p	η_p^2	$F(6, 437)$	p	η_p^2
User knowledge									
Agent domain (e-commerce) knowledge	0.78	.51	.01	.09	.91	.00	.64	.70	.01
Persuasion (general) knowledge	0.34	.80	.00	0.00	1.00	.00	1.38	.22	.02
Topic (product) knowledge	0.34	.79	.00	0.17	.85	.00	0.80	.57	.01
Other control									
Time spent on the about page	1.04	.37	.01	.01	.99	.00	0.63	.71	.01

Table 62. Two-way ANOVAs for control variables in empirical study 2

Next, I examine the effect of suggestive content (content control, "We recommend this," "Best-selling item," and "Low in stock"), persuasion transparency information (no information, non-persuasion information, and persuasion transparency), and their interaction on persuasion awareness.

5.3.3 Manipulation Checks

5.3.3.1 Perceived Suggestive Design

The Cronbach's alpha for the Perceived Suggestive Design scale was 0.70, indicating sufficient internal consistency reliability. The means and standard deviations are presented in Table 63. Table 64 presents the ANOVA statistics.

Results from a two-way ANOVA revealed a significant effect of the *suggestive content* manipulation with a large effect size. Transparency information and a suggestive content x transparency information interaction did not significantly influence perceived suggestive design (a small effect size). Follow-up tests using a Bonferroni correction indicated that "We recommend this" significantly led to higher perceived suggestive design than the content control, $p < .001$, "Best-selling item," $p < .001$, and "Low in stock," $p < .001$. Also, "Best-selling item" was perceived as more suggestive than the content control, $p = .01$, and "Low in stock," $p < .001$. No other significant differences were found, $p > .05$. A website featuring claim content significantly led to higher perceived suggestive design than a website without claim content. Therefore, a website featuring "We recommend this" led to the highest degree of perceived suggestive design. A website displaying "Best-selling" had a moderate level of perceived suggestive design. However, a website with "Low in stock" did not influence users' perceived suggestive design. In sum, the suggestive content manipulation was effective. Figure 24 presents the difference in

perceived suggestive design between the suggestive content and transparency information manipulation.

Suggestive Content	Persuasion Transparency Information	Mean	Standard Deviation
Content Control	No information	3.04	1.58
	Non-persuasion information	3.26	1.65
	Persuasion transparency	3.29	1.51
	Total	3.19	1.57
We recommend this	No information	5.04	1.37
	Non-persuasion information	4.59	1.60
	Persuasion transparency	4.79	1.63
	Total	4.81	1.53
Best-selling item	No information	3.77	1.57
	Non-persuasion information	4.06	1.68
	Persuasion transparency	3.75	1.58
	Total	3.85	1.60
Low in stock	No information	2.84	1.52
	Non-persuasion information	2.99	1.53
	Persuasion transparency	3.12	1.29
	Total	2.99	1.44
Total	No information	3.66	1.73
	Non-persuasion information	3.74	1.72
	Persuasion transparency	3.71	1.62

Suggestive Content	Persuasion Transparency Information	Mean	Standard Deviation
	Total	3.70	1.69

Table 63. Means and standard deviations of perceived suggestive design in the suggestive content and the persuasion transparency information condition in empirical study 2

Effect	F	p	η_p^2
Suggestive content	31.19[a]	.00	.18
Persuasion transparency information	0.08[b]	.92	0.00
Suggestive content x persuasion transparency information	0.60[c]	.73	.01

Note: [a] $F(3, 437)$, [b] $F(2, 437)$, [c] $F(6, 437)$

Table 64. Two-way ANOVA for perceived suggestive design in empirical study 2
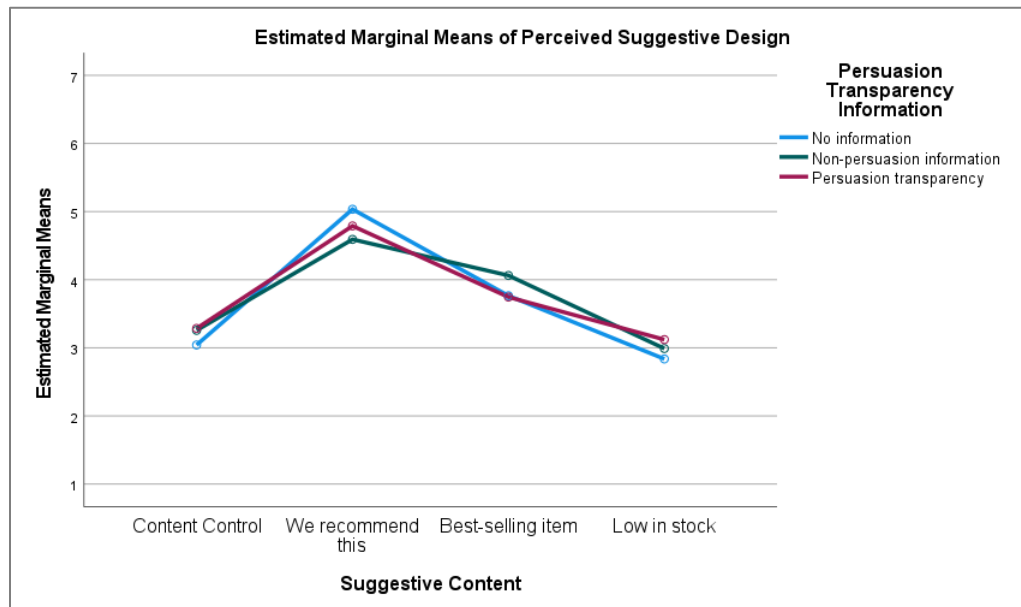
Figure 24. The difference in perceived suggestive design between the suggestive content and the persuasion transparency information condition in empirical study 2

5.3.3.2   Perceived Availability of Persuasion Transparency Information

In this analysis, APT2 was used in both batches of the experiment. Thus, the effectiveness of persuasion transparency information was evaluated in terms of this scale item. Table 65 and Table 66, respectively, report the means and standard deviations and the statistics. A two-way ANOVA

was performed. Results suggested that there was a significant impact of the manipulation of persuasion transparency information with a small effect size. No other effects were found. Follow-up tests using a Bonferroni correction showed that the presence of persuasion transparency information significantly induced higher perceived availability of persuasion transparency information than the no information condition, $p = .01$. There were no other significant differences. Thus, the manipulation of persuasion transparency information was relatively successful. Consistent with my expectation, the presence of persuasion transparency information increased users' perception of its availability. Figure 25 displays the differences in perceived availability of persuasion transparency information.

Suggestive Content	Persuasion Transparency Information	Mean	Standard Deviation
Content Control	No information	2.77	1.55
	Non-persuasion information	3.14	1.99
	Persuasion transparency	3.11	1.91
	Total	3.00	1.81
We recommend this	No information	3.18	1.92
	Non-persuasion information	3.39	1.54
	Persuasion transparency	3.66	1.71
	Total	3.40	1.73
Best-selling item	No information	2.97	1.76
	Non-persuasion information	3.27	1.81
	Persuasion transparency	3.50	2.03
	Total	3.26	1.87

Suggestive Content	Persuasion Transparency Information	Mean	Standard Deviation
Low in stock	No information	2.85	1.90
	Non-persuasion information	2.91	1.98
	Persuasion transparency	3.93	1.62
	Total	3.25	1.88
Total	No information	2.94	1.77
	Non-persuasion information	3.18	1.82
	Persuasion transparency	3.56	1.83
	Total	3.23	1.82

Table 65. Means and standard deviations of perceived availability of persuasion transparency information in the suggestive content and the persuasion transparency information condition in empirical study 2

Effect	F	p	η_p^2
Suggestive content	0.90^a	.44	.01
Persuasion transparency information	4.32^b	.01	.02
Suggestive content x persuasion transparency information	0.62^c	.72	.01

Note: [a] $F(3, 437)$, [b] $F(2, 437)$, [c] $F(6, 437)$

Table 66. Two-way ANOVA in perceived availability of persuasion transparency information in empirical study 2
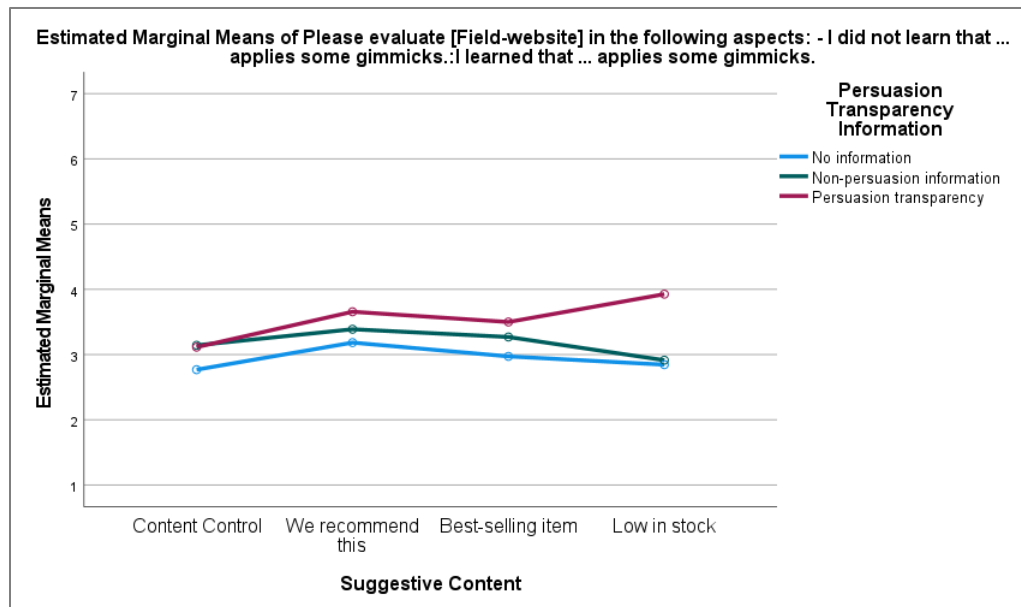
Figure 25. The difference in perceived availability of persuasion transparency information between the suggestive content and the persuasion transparency information condition in empirical study 2

5.3.3.3 Discussion of the Manipulation Checks

The above manipulation checks provide support for the relatively successful suggestive content and persuasion transparency information manipulation. For the suggestive content manipulation, the "We recommend this" condition is the most suggestive than the control, the "Best-selling item," and the "Low in stock" conditions. The "Best-selling" condition is more suggestive than the control and the "Low in stock" condition. However, the manipulation of "Low in stock" is not suggestive. Also, those with persuasion transparency information perceive that persuasion transparency information is available to them more than those without such information. Therefore, the persuasion transparency information is relatively successful.

5.3.4   Results on Perceived Personalization

5.3.4.1   Effect of Suggestive Content and Persuasion Transparency Information

The Cronbach's alpha for the Perceived Personalization scale was 0.75, indicating sufficient internal consistency reliability. A two-way ANOVA was conducted. The means and standard deviations are presented in Table 67. The statistics are reported in Table 68. Results indicated a significant effect of suggestive content with a small effect size, no significant impact of persuasion transparency information, and no significant interaction effect between suggestive content and persuasion transparency information. Follow-up tests using a Bonferroni correction showed that "We recommend this" led to significantly higher perceived personalization than "Low in stock," $p = .02$, and marginally significantly higher perceived personalization than "Best-selling item," $p = .06$. No other significant differences were found, $p > .05$. In other words, a website with "We recommend this" had a significantly higher level of perceived personalization than a website with "Low in stock," and a marginally significantly higher degree of perceived personalization than a website with "Best-selling item." As a result, suggestive content had a significant impact on perceived personalization. See Figure 26 for the difference in perceived personalization between the suggestive content and the persuasion transparency conditions.

Suggestive Content	Persuasion Transparency Information	Mean	Standard Deviation
Content Control	No information	4.50	1.20
	Non-persuasion information	4.47	1.32
	Persuasion transparency	4.67	1.27
	Total	4.54	1.25
We recommend this	No information	4.87	1.18

Suggestive Content	Persuasion Transparency Information	Mean	Standard Deviation
	Non-persuasion information	4.60	1.08
	Persuasion transparency	5.04	1.00
	Total	4.83	1.10
Best-selling item	No information	4.62	1.20
	Non-persuasion information	4.26	1.35
	Persuasion transparency	4.33	1.23
	Total	4.40	1.26
Low in stock	No information	4.37	1.23
	Non-persuasion information	4.39	1.22
	Persuasion transparency	4.25	1.45
	Total	4.33	1.30
Total	No information	4.59	1.20
	Non-persuasion information	4.43	1.24
	Persuasion transparency	4.55	1.28
	Total	4.52	1.24

Table 67. Means and standard deviations of perceived personalization in the suggestive content and the persuasion transparency information condition in empirical study 2

Effect	F	p	η_p^2
Suggestive content	3.56[a]	.01	.02
Persuasion transparency information	0.74[b]	.48	.00
Suggestive content x persuasion transparency information	0.57[c]	.75	.01

Note: [a] $F(3, 437)$, [b] $F(2, 437)$, [c] $F(6, 437)$

Table 68. Two-way ANOVA in perceived personalization design in empirical study 2
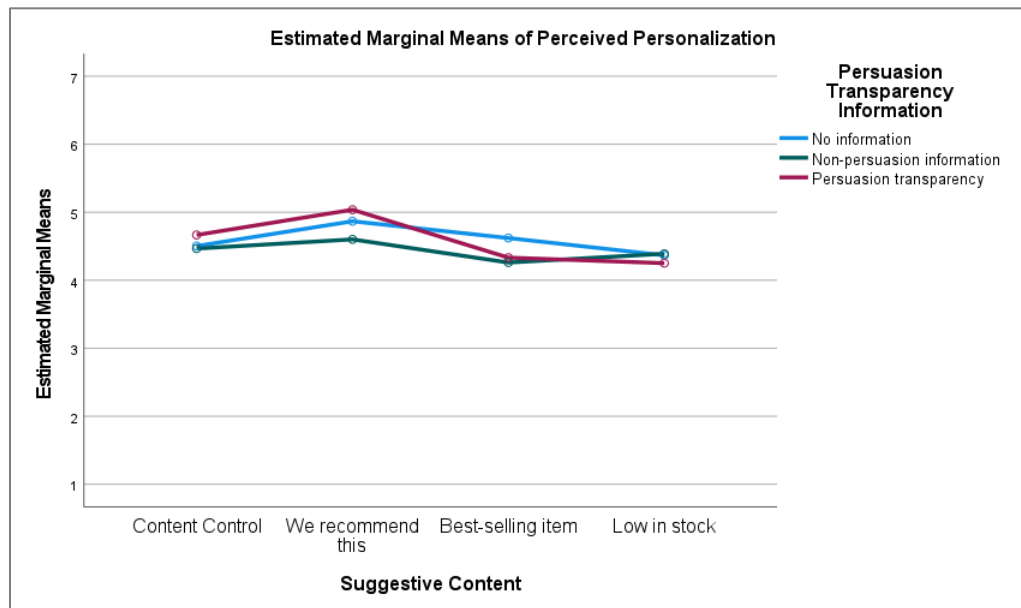
Figure 26. The difference in perceived personalization between the suggestive content and the persuasion transparency information condition in empirical study 2

5.3.4.2 Discussion on Perceived Personalization

The above analysis provides support for the effect of suggestive content, "We recommend this," on perceived personalization, thus partially supporting H12. While empirical study 1 shows that only the presence of data content increases perceived personalization, empirical study 2 reveals that only "We recommend this" content, claim content, increases perceived personalization more than the two data content conditions, "Low in stock" and "Best-selling item." However, the data content manipulation in empirical study 1 includes the claim & data and the data → claim as well. Thus, the data-only manipulation in this empirical study might be less effective in enhancing perceived personalization than the data and the claim-data combination in empirical study 1. To resolve this issue, I ran additional analyses for the four suggestive content conditions used in both empirical studies. See Appendix N N.1 for more detail. Results from these analyses support only the impact of suggestive content, specifically, "We recommend this," on perceived personalization

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with a small effect size. In summary, suggestive content shapes users' perceived personalization, while persuasion transparency information does not.

5.3.5 Results on Persuasion Awareness

5.3.5.1 Perceived Persuasion

5.3.5.1.1 Effect of Suggestive Content and Persuasion Transparency Information

For the sake of parsimony, I conducted a two-way ANOVA using the higher-order perceived persuasion latent variable score. The Cronbach's alpha for the Perceived Persuasion was 0.84 after the two perceived agent benefits items (WBenefit_S1 and WBenefit_S3_R) were removed, indicating sufficient internal consistency reliability. The means and standard deviations of the higher-order perceived persuasion appear in Table 69. Table 70 reports the statistics. Results showed a significant effect of suggestive content with a medium effect size, no significant impact for persuasion transparency information with a trivial effect size, and no significant suggestive x persuasion transparency information interaction with a small effect size. Follow-up tests using a Bonferroni were conducted. Results demonstrated that "We recommend this" significantly contributed to higher perceived persuasion than the content control condition, $p < .001$, and "Low in stock," $p < .001$. Also, "Best-selling item" significantly led to higher perceived persuasion than the content control condition, $p = .02$. That is, providing "We recommend this" and "Best-selling item" resulted in higher perceived persuasion. See Figure 27 for the difference in the higher-order perceived persuasion between the suggestive content and the persuasion transparency information conditions.

Suggestive Content	Persuasion Transparency Information	Mean	Standard Deviation
Content Control	No information	-0.21	0.91
	Non-persuasion information	-0.23	0.90
	Persuasion transparency	-0.44	0.81
	Total	-0.29	0.87
We recommend this	No information	0.27	1.03
	Non-persuasion information	0.38	1.06
	Persuasion transparency	0.51	1.03
	Total	0.39	1.04
Best-selling item	No information	0.01	0.98
	Non-persuasion information	0.10	1.09
	Persuasion transparency	0.20	1.04
	Total	0.10	1.03
Low in stock	No information	-0.34	0.88
	Non-persuasion information	-0.06	1.12
	Persuasion transparency	-0.17	0.77
	Total	-0.19	0.92
Total	No information	-0.07	0.97
	Non-persuasion information	0.05	1.06
	Persuasion transparency	0.02	0.98
	Total	0.00	1.00

Table 69. Means and standard deviations of perceived persuasion in the suggestive content and the persuasion transparency information condition in empirical study 2

Effect	F	p	η_p^2
Suggestive content	10.98[a]	.00	.07
Persuasion transparency information	0.58[b]	.56	.00
Suggestive content x persuasion transparency information	0.60[c]	.73	.01

Note: [a] $F(3, 437)$, [b] $F(2, 437)$, [c] $F(6, 437)$

Table 70. Two-way ANOVA in perceived persuasion in empirical study 2
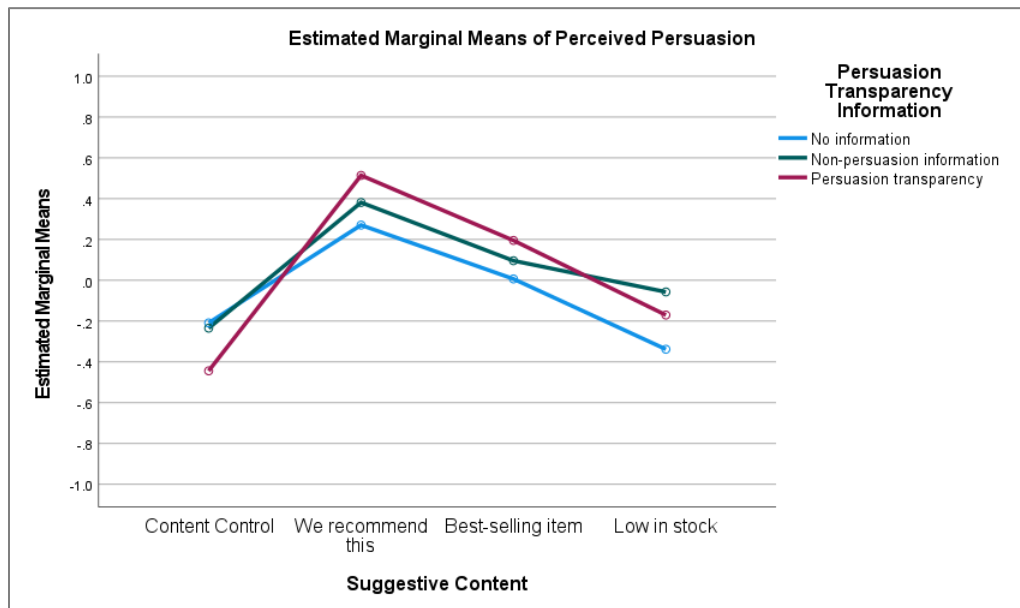
Figure 27. The difference in perceived persuasion between the suggestive content and the persuasion transparency information condition in empirical study 2

5.3.5.1.2   Discussion on Perceived Persuasion

Overall, providing suggestive content increases perceived persuasion. Specifically, providing "We recommend this" or "Best-selling item" makes users aware of persuasion. However, "Low in stock" does not. These results relatively replicate the results of empirical study 1. In empirical study 1, the presence of claim or data content leads to higher perceived persuasion. Thus, H8 is supported. Additionally, persuasion transparency information does not influence perceived persuasion. In other words, providing persuasion transparency information does not enhance users'

perceived persuasion, thereby failing to support H21a. As a result, suggestive content strengthens users' perceived persuasion, whereas persuasion transparency information does not.

5.3.5.2   Perceived Assistance

5.3.5.2.1   Effect of suggestive content and persuasion transparency information

For the sake of parsimony, I performed a two-way ANOVA using the higher-order perceived assistance latent variable score. The Cronbach's alpha for the Perceived Persuasion was 0.87, indicating sufficient internal consistency reliability. The means and standard deviations of the higher-order perceived assistance are included in Table 71. Table 72 shows the statistics.

Results disclosed a marginally significant effect of suggestive content with a small effect size, a marginally significant impact of persuasion transparency information with a small effect size, and no significant suggestive x persuasion transparency information interaction with a small effect size. Follow-up tests using a Bonferroni correction were conducted. Results revealed no significant differences were found. This might be due to the fact that the Bonferroni correction is too conservative. For suggestive content, results without a correction suggested that "We recommend this" significantly had higher perceived assistance than "Best-selling item," $p = .02$, and "Low in stock," $p = .03$. Also, without a correction, results demonstrated that no information significantly resulted in higher perceived assistance than non-persuasion information, $p = .05$, and persuasion transparency, $p = .05$. The reason that non-persuasion information decreased perceived assistance would be the fact that this kind of information was not relevant to users' decision tasks and thus did not assist them. However, the reason why persuasion transparency information decreased perceived assistance would be because it reveals persuasion tactics used on a website. This was consistent with the results on perceived persuasion tactic knowledge (Appendix N N.3). That is,

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when "We recommend this" or "Best-selling item" information was provided on a website, those who received persuasion transparency felt that suggestive content was less assistive than those who obtained non-persuasion information and no information, respectively. Hence, persuasion transparency reduced perceived assistance. See Figure 28 for the difference in the higher-order perceived assistance between the suggestive content and the persuasion transparency information condition.

Suggestive Content	Persuasion Transparency Information	Mean	Standard Deviation
Content Control	No information	-0.21	0.91
	Non-persuasion information	-0.23	0.90
	Persuasion transparency	-0.44	0.81
	Total	-0.29	0.87
We recommend this	No information	0.27	1.03
	Non-persuasion information	0.38	1.06
	Persuasion transparency	0.51	1.03
	Total	0.39	1.04
Best-selling item	No information	0.01	0.98
	Non-persuasion information	0.10	1.09
	Persuasion transparency	0.20	1.04
	Total	0.10	1.03
Low in stock	No information	-0.34	0.88
	Non-persuasion information	-0.06	1.12
	Persuasion transparency	-0.17	0.77

Suggestive Content	Persuasion Transparency Information	Mean	Standard Deviation
	Total	-0.19	0.92
Total	No information	-0.07	0.97
	Non-persuasion information	0.05	1.06
	Persuasion transparency	0.02	0.98
	Total	0.00	1.00

Table 71. Means and standard deviations of perceived assistance in the suggestive content and the persuasion transparency information condition in empirical study 2

Effect	F	p	η_p^2
Suggestive content	2.26^a	.08	.02
Persuasion transparency information	2.61^b	.08	.01
Suggestive content x persuasion transparency information	0.52^c	.79	.01

Note: [a] $F(3, 437)$, [b] $F(2, 437)$, [c] $F(6, 437)$

Table 72. Two-way ANOVA in perceived assistance in empirical study 2
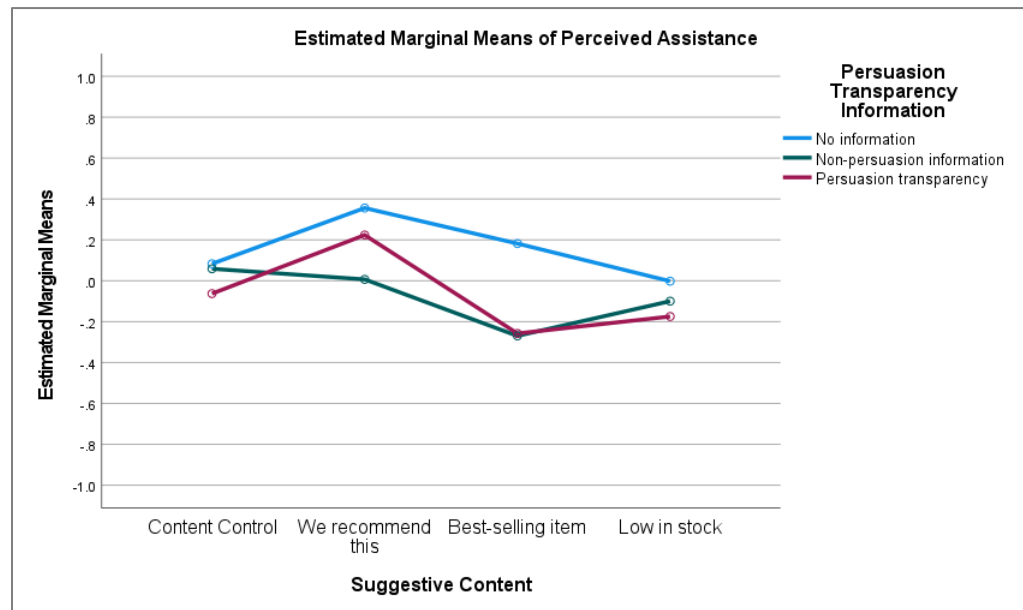
Figure 28. The difference in perceived assistance between the suggestive content and the persuasion transparency information condition in empirical study 2

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5.3.5.2.2   Perceived Personalization as a Mediator

I investigated the mediation effect of perceived personalization on the relationship between the suggestive content on perceived assistance, as well as the effect of persuasion transparency information on perceived assistance. Following Baron and Kenny (1986), there are four criteria to be established. First, the relationship between independent variables and a dependent variable should be significant. In other words, the suggestive content and persuasion transparency are significant predictors of perceived assistance. A two-way ANOVA with suggestive content and persuasion transparency information as independent variables was conducted. Previously I showed that suggestive content, specifically "We recommend this," marginally significantly predicted perceived assistance with a small effect size. Also, persuasion transparency marginally significantly influenced perceived assistance with a trivial effect size. This provided some support to this first criterion. Secondly, a significant relationship between an independent variable and a mediator should be established. That is, suggestive content and persuasion transparency are significant predictors of perceived personalization. Supported in the previous analysis (see 5.3.4.1), only suggestive content significantly predicted perceived personalization with a small effect size, while persuasion transparency did not. Thirdly, there is a significant relationship between a mediator and a dependent variable. Lastly, after controlling for a mediator, the relationship between an independent variable and a dependent variable should become nonsignificant or reduced. To test the third and fourth criteria, I applied a two-way ANOVA with suggestive content and persuasion transparency information as independent variables and perceived personalization as a covariate. The statistics appear in Table 73. Results revealed that suggestive content became non-significant after controlling for perceived personalization with a trivial effect size, while perceived personalization significantly predicted perceived assistance with

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a large effect size. Also, the effect of persuasion transparency information became significant with a small effect size after controlling for the effect of perceived personalization. That is, perceived personalization reduced the amount of variation in perceived assistance, thereby making the effect of persuasion transparency information more powerful (Miller and Chapman 2001). Hence, perceived personalization mediated the effect of suggestive content on perceived assistance. Specifically, suggestive content influenced perceived personalization which, in turn, affected perceived assistance, and persuasion transparency information affected perceived assistance. Figure 29 depicts the difference in perceived assistance after controlling for perceived personalization.

Effect	F	p	η_p^2
Suggestive content	0.27[a]	.85	.00
Persuasion transparency information	3.16[b]	.04	.01
Suggestive content x persuasion transparency information	0.32[c]	.93	.00
Perceived personalization	320.52[d]	0.00	0.42

Note: [a] $F(3, 436)$, [b] $F(2, 436)$, [c] $F(6, 436)$, [d] $F(1, 436)$

Table 73. Two-way ANOVA in perceived assistance with perceived personalization as a covariate in empirical study 2
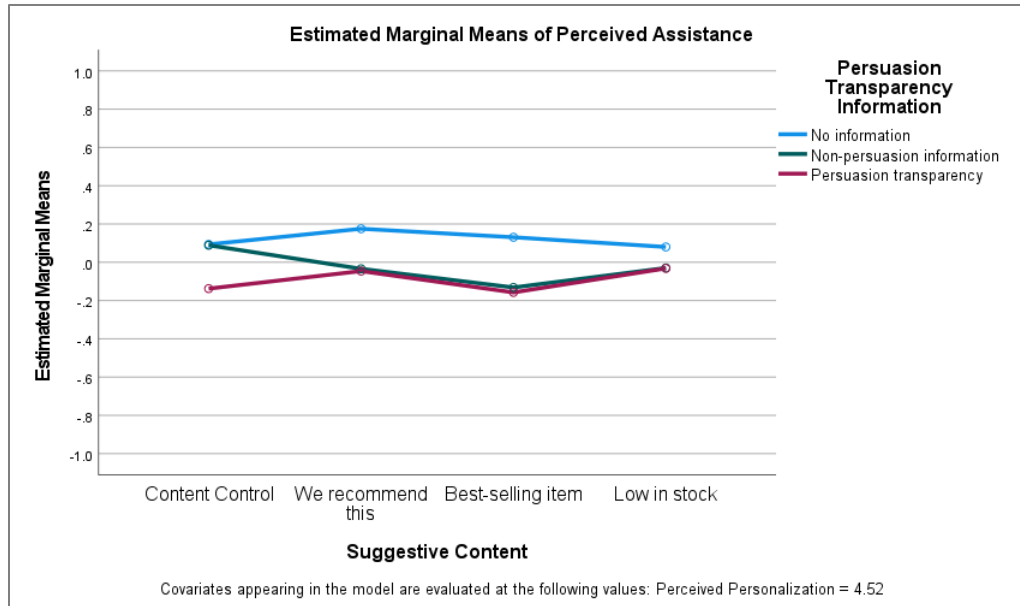
Figure 29. The difference in perceived assistance between the suggestive content and the persuasion transparency information condition after controlling for perceived personalization in empirical study 2

5.3.5.2.3   Discussion on Perceived Assistance

The above analyses lend support for the impact of suggestive content on perceived assistance. That is, giving suggestive content, "We recommend this," increases perceived assistance, therefore partially supporting H10. On the other hand, adding persuasion transparency information decreases perceived assistance. Also, perceived personalization mediates the effect of suggestive content on perceived assistance. In other words, suggestive content, specifically "We recommend this," strengthens perceived personalization, partially supporting H12, which, in turn, leads to perceived assistance, supporting H16; the latter is lowered by persuasion transparency information, supporting H22a.

Figure 30 presents a summary of ANOVA results in persuasion awareness.

Note: * *p* < .10, ** *p* < .05, *** *p* < .001, n.s. *p* > .1 level, rectangles = observable constructs, ellipses = non-observable constructs
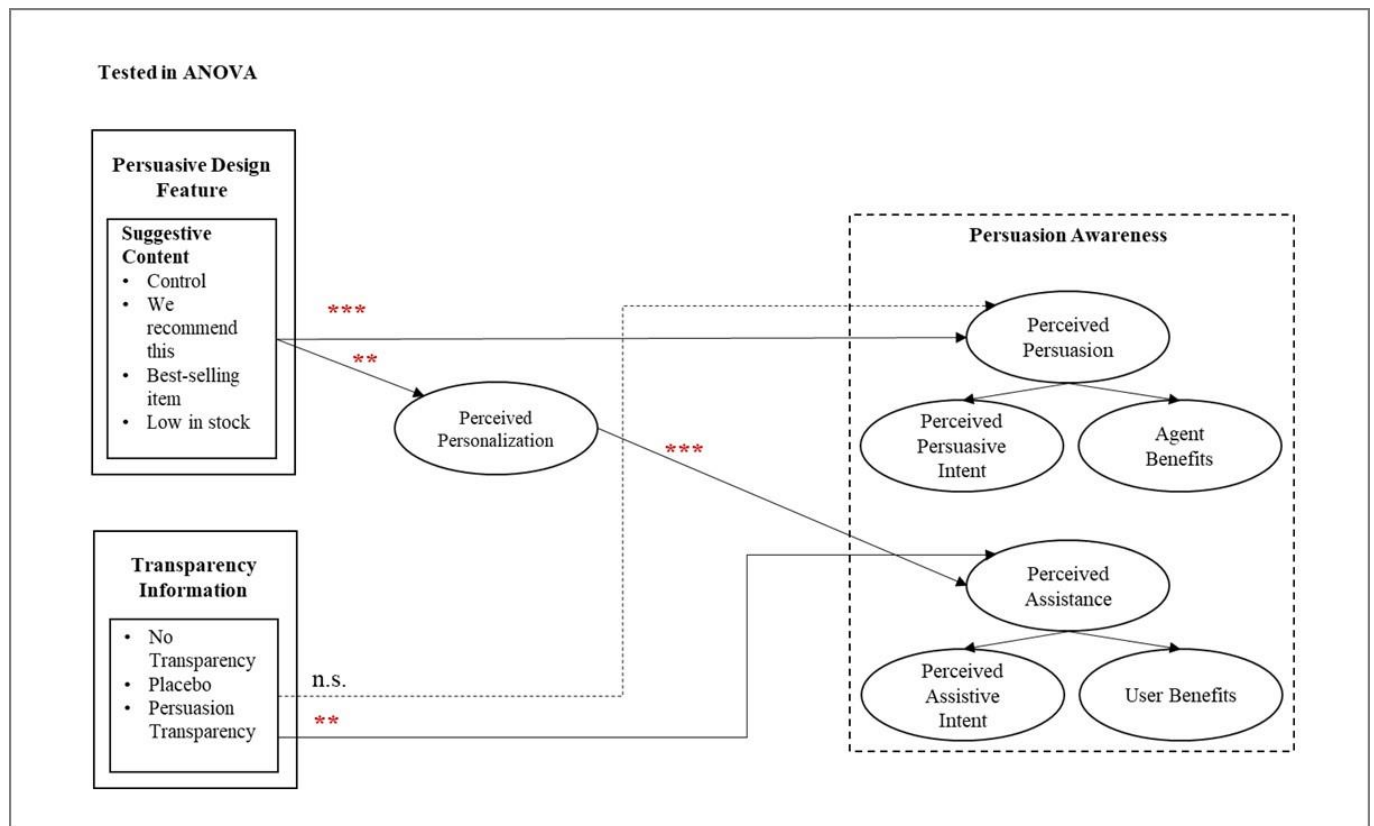
Figure 30. Summary of ANOVA results in persuasion awareness in empirical study 2

5.3.6 Impacts of Perceived Suggestive Design and Perceived Availability of Persuasion Transparency Information on Persuasion Awareness

In this analysis, perceived suggestive design (Suggest3_R removed to improve the reliability) and perceived availability of persuasion transparency information (APT2) serve as a proxy of the suggestive content and the transparency information manipulation, respectively. PLS was used to investigate the structural model proposed in Figure 19. However, this model employed perceived suggestive design and perceived availability of persuasion transparency information instead.

Bootstrap resampling was performed on the structural model. Table 74 and Figure 31 show the results. In line with the effect of suggestive content on perceived persuasion (see 5.3.5.1.1),

perceived suggestive design significantly and positively influenced perceived persuasion. Also, perceived suggestive design significantly and positively affected perceived personalization, which, in turn, significantly and positively influenced perceived assistance. This aligns with the effect of suggestive content on perceived personalization and perceived assistance (see 5.3.5.2.2). However, inconsistent with the effects of persuasion transparency manipulation in the previous analyses, the perceived availability of persuasion transparency significantly increased perceived persuasion. At the same time, it marginally significantly decreased perceived assistance. 39%, 46%, and 12% of the variance in perceived persuasion, perceived assistance, and perceived personalization, respectively, were explained.

Effect	R^2	t	p
Perceived persuasion	0.39		
Perceived suggestive design → perceived persuasion		12.60	.00
Perceived availability of persuasion transparency → perceived persuasion		4.23	.00
Perceived personalization	0.12		
Perceived suggestive design → perceived personalization		7.85	.00
Perceived assistance	0.46		
Perceived personalization → perceived assistance		22.74	.00
Perceived availability of persuasion transparency → perceived assistance		1.71	.09

Table 74. Structural path analysis using PLS in empirical study 2 using perceived suggestive design and perceived availability of persuasion transparency
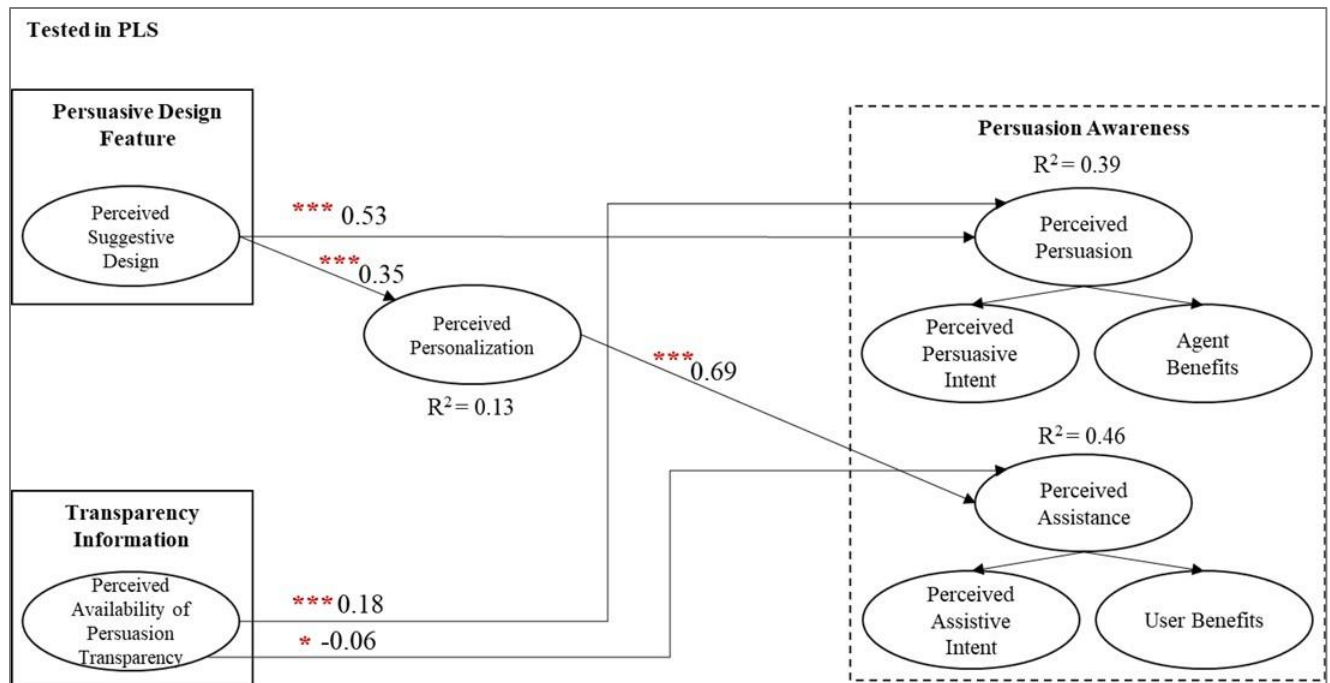
Note: * $p < .10$, ** $p < .05$, *** $p < .001$, n.s. $p > .1$ level, rectangles = observable constructs, ellipses = non-observable constructs

Figure 31. Structural path model in empirical study 2 using perceived suggestive design and perceived availability of persuasion transparency

5.3.6.1 Summary of Structural Path Model

The above analysis provides additional support to the following: 1) the significant impact of perceived suggestive design on perceived persuasion (H8), 2) the significant effect of perceived suggestive design on perceived assistance through perceived personalization (H12 and H16) 3) the significant impact of perceived availability of persuasion transparency on perceived persuasion (H21a), and 4) the marginally significant effect of perceived persuasion transparency availability on perceived assistance (H22a).

5.4 Conclusion

5.4.1 Summary

Table 75 summarizes the outcomes of hypotheses testing.

Hypotheses	Supported?
H8: Online entities that provide suggestive PDFs will increase users' perceived persuasion.	Yes
H10: Online entities that provide the suggestive form of PDFs will increase users' perceived assistance.	Partially, only "We recommend this" increases perceived assistance.
H12: Online entities that provide the suggestive form of PDFs will increase users' perceived personalization.	Partially, only "We recommend this" increases perceived personalization.
H16: Perceived personalization will enhance perceived assistance.	Yes
H21a: Persuasion transparency will increase users' perceived persuasion.	No, for persuasion transparency manipulation; yes, for perceived availability of persuasion transparency
H22a: Persuasion transparency will decrease users' perceived assistance.	Yes, for persuasion transparency manipulation; Marginal support for perceived availability of persuasion transparency

Table 75. Hypotheses testing results in empirical study 2

5.4.2 Discussion

Overall results show that suggestive content and persuasion transparency information influence users' persuasion awareness. Relatively consistent with empirical study 1, suggestive content, claim and data content, significantly influence perceived persuasion. "We recommend this" reflects claim content, while "Best-selling item" and "Low in stock" feature data content. It appears that an online entity featuring "We recommend this" or "Best-selling item" makes users aware of persuasion significantly more than an entity giving no suggestive content or "Low in stock." This implies that users do not interpret an entity with "Low in stock" as a persuasion attempt.

In addition, this empirical study provides additional support for the effect of suggestive content on users' perceived assistance. Whereas empirical study 1 shows the significant impact of data on perceived assistance, this empirical study reveals that a claim, "We recommend this," increases perceived assistance. As discussed earlier, the previous empirical study employs two additional data conditions that feature data (C & D and D → C) and one additional claim condition, which might enhance the effect of data and dampen the impact of claim content. However, if the four shared suggestive content conditions in both empirical studies are compared, "We recommend this" marginally significantly increases perceived assistance. Thus, the suggestive content, specifically "We recommend this," heightens perceived assistance.

In line with personalization research's evidence for positive outcomes (e.g., Komiak and Benbasat 2006) and empirical study 1, perceived personalization significantly increases perceived assistance. The mediation analysis supports that perceived personalization mediates the impact of suggestive content on perceived assistance. This means providing "We recommend this" increases

perceived personalization, which, in turn, shapes the perceived assistance of an online agent. Consequently, personalization is an important factor influencing persuasion awareness.

This study also demonstrates that persuasion transparency affects users' persuasion awareness. Although the design of suggestive content affects users' persuasion perception, persuasion transparency information does not significantly increase their perceived persuasion. In other words, persuasion transparency information does not enhance their perceived persuasion of an online entity they interact with. However, a proxy of persuasion transparency, perceived availability of persuasion transparency, significantly increases perceived persuasion. Thus, persuasion transparency can increase perceived persuasion. Also, persuasion transparency information significantly decreases users' perceived assistance, after controlling for perceived personalization. Similarly, the analysis on perceived availability of persuasion transparency on perceived assistance shows marginal support. Overall, it appears that persuasion transparency information can elevate perceived persuasion and dampen perceived assistance.

These results seem to be consistent with Williams et al. (2004). In their study, providing information to educate individuals about a persuasion tactic (i.e., the presence of an intention question that promotes targeted behaviors) impacts their perceived persuasive intent and thus behaviors. However, empirical study 2 differs from their study in terms of how persuasion awareness is operationalized and measured and persuasion transparency information manipulation. Their study focuses only on perceived persuasive intent. On the other hand, my study taps on both perceived persuasion and perceived assistance. In their study context, the presence of an intention question would not be related to perceived assistive intent. However, suggestive content an online entity provides can increase perceived assistance. Thus, persuasion transparency information

would influence perceived persuasion and assistance. Also, while their research presents an article as a research abstract about the mere-measure effect, a persuasion tactic, from the Journal of Consumer Research, I provide information about three tactics an experimental website might use on the about page. The mere measure-effect tactic might be something individuals, in general, might not be aware of. In contrast, the three tactics described on the about page might be something they are familiar with. Nevertheless, the analysis in Appendix N N.3 points out that those without persuasion transparency information significantly perceive "We recommend this" and "Best-selling item" as more assistive than those with persuasion transparency information. Thus, persuasion transparency information would help educate those in "We recommend this" and "Best-selling item."

Nonetheless, the presence of persuasion transparency information does not significantly moderate the impact of these two conditions on perceived persuasion or assistance. The reason might be that my persuasion transparency information offers warning messages in addition to explanations regarding persuasion tactics. According to Xiao and Benbasat (2015), providing a warning about the risk of biased product recommendation without advice regarding a means to handle such risk increases the likelihood of bias detection for those who receive an honest recommendation and a bias one. In other words, the presence of warning messages increases the chance of a bias recommendation detected at the cost of increased false alarms. In line with this, the empirical 2's results echo the fact that the inclusion of warning messages in persuasion transparency information would decrease perceived assistance of an online entity regardless of the presence of suggestive content. That is, persuasion transparency with warning messages significantly reduces perceived assistance for all users who receive it. Also, the perceived availability of persuasion transparency

increases perceived persuasion for all users. Thus, the presence of persuasion transparency with warning messages can enhance perceived persuasion and dampen perceived assistance.

In sum, empirical study 2 gives additional evidence that suggestive content is an important factor driving persuasion awareness. Specifically, an online entity that provides "We recommend this" increases both perceived persuasion and assistance, while an entity with "Best-selling item" increases only perceived persuasion. In addition, persuasion transparency information increases perceived persuasion and decreases perceived assistance. Although users without persuasion transparency information perceive "We recommend this" and "Best-selling item" as more assistive than those with persuasion transparency information, the presence of persuasion transparency information does not moderate the effect of suggestive content on persuasion awareness. As persuasion transparency information includes warning messages without advice, it increases an alarm for all users and thus increases the perceived persuasion and decreases the perceived assistance of an online entity.

5.4.3   Theoretical and Practical Contributions

5.4.3.1   Theoretical Contributions

The theoretical contributions of this study are two-fold. First, to the best of my knowledge, this study represents an early effort to systematically designs persuasion transparency information and evaluates its impact on persuasion awareness in online settings. Much attention has been paid to sponsorship disclosure that aligns with agent information in my study. For instance, Wei et al. (2008) investigate how brand disclosure of product placement in the radio show influences individuals' perceptions and brand evaluation. As another example, Wang et al. (2018) study how sponsorship disclosure and explanations regarding actions of a recommendation agent (RA)

influence trust and distrust in RA. While these studies focus on how agent transparency information affects individuals' perceptions and evaluations, persuasion transparency information has received little attention. As PKM posits, individuals can learn about persuasion knowledge over time (Friestad and Wright 1994). This suggests that providing persuasion transparency information to users will not only help with the current transaction, but also educate them to use this particular knowledge in future transactions. As a result, I empirically design persuasion transparency information and test it in an e-commerce context.

Secondly, I extend persuasion transparency information to include warning messages. To develop persuasion transparency information, I adopt the three persuasion tactics from Cialdini (1983) to explain how an online entity uses the three techniques to enable persuasion. This aligns with how Williams et al. (2004) presents information concerning a persuasion tactic in their study. However, extending their persuasion transparency information design, I follow Xiao and Benbasat (2015) by adding warning messages to enlighten users in a stronger way. Unlike Williams et al. (2004), I also capture the perceived assistance of an agent. In this manner, my findings reveal that persuasion transparency information increases perceived persuasion and decreases perceived assistance. As a result, this study provides evidence for the effect of persuasion transparency information on perceived persuasion and assistance.

5.4.3.2   Practical Contributions

Overall, the results of this study have provided concrete guidelines in designing persuasion transparency information that can be used in e-commerce websites, social networking sites, and other online platforms. Facebook and other online entities have implemented transparency information. For instance, Facebook provides agent transparency information such as page

transparency appeared on top of each Facebook page. Also, it gives target transparency information when users click "Why am I seeing this?" on an ad. Amazon.com provides topic transparency information. For example, it features an article about a product category that helps you evaluate and select a product. Although these pieces of information have been provided to online users, persuasion transparency has not been implemented.

Persuasion transparency information increases users' perceived persuasion of an entity and decreases their perceived assistance from it. This is not good for the entity's side. Nevertheless, users can learn about persuasion tactics used and the real intent of such entity from the transparency information. Thus, I recommend that when suggestive content or other persuasion tactics are used, persuasion transparency information should be given to users to make them more aware of such tactics. I expect that this will enhance their persuasion knowledge repertoire, since persuasion transparency information better reflects a proper level of persuasion and assistance of an entity. Thus, their evaluation and decision would be better informed.

In conclusion, this study has provided a possible design of persuasion transparency information to enlighten users about an online entity's tactics and theoretical explanations concerning how such design stimulates users' persuasion awareness.

5.4.4 Limitations

In this current study, I investigate only one form of persuasion transparency information. This persuasion transparency information explains three common persuasion tactics found in online platforms with warning messages. As discussed in Chapter 3: section 3.2.3, there are different ways to manipulate persuasion transparency information. For instance, Kirmani and Zhu (2007) employed fraud information unrelated to a persuasion attempt in their study and found its impact

on perceived persuasive intent. This suggests that persuasion transparency information does not need to directly link to a current persuasion attempt to enhance individuals' persuasion awareness. As another example, Cowley and Barron (2008) show that providing a product ad before individuals viewed the show featuring product placement could influence their perceived persuasion. These manipulations can serve as persuasion transparency information, since they trigger individuals to aware of persuasion attempts. While these examples found the positive relationship between their manipulations and perceived persuasive intent, my persuasion transparency information demonstrates only a negative impact on perceived assistance and no effect on perceived persuasion. Thus, it should be noted that different manipulations of persuasion transparency information can yield similar or different outcomes. However, the overall findings lend support to the effect of persuasion transparency information on persuasion awareness. That is, its presence can influence users' persuasion awareness, through decreased perceived assistance.

Additionally, the context in which persuasion transparency is manifested would influence the generalizability of this study. This study presents persuasion transparency information. As prior research suggests, there are differences in evaluation and decision strategies used between mobile and desktop users (Lee and Benbasat 2010). In this manner, desktop users would not find it difficult to read such information. However, if this information is presented on a mobile screen, users would find it difficult to read and thus skip it. Therefore, the findings of this study are most appropriately generalizable to the design for desktop users. Also, the length of persuasion transparency information is limited to 220 words in this study. Although this information requires some cognitive processing capacity, this study reveals that users do not significantly spend more time reading this information. Nevertheless, longer persuasion transparency information might result in different outcomes. Prior research found that cognitive capacity influenced persuasion awareness

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(e.g., Williams et al. 2004). With limited capacity, individuals are less likely to detect perceived persuasion. Accordingly, the longer information will require more users' cognitive effort, thus having less impact on their persuasion awareness.

5.4.5   Future Research

This study has investigated the effect of suggestive content and persuasion transparency information on users' persuasion awareness. Persuasion transparency information details the three persuasion tactics used in an experimental website. However, participants were only assigned to see no suggestive content or one of the three tactics. Thus, the presence of persuasion transparency information increases false alarms for those who do not see suggestive content. Also, persuasion transparency information should correspond to the suggestive content given to users. This will help reduce users' cognitive effort in processing persuasion transparency information and increase the integrity perception of an online entity. Hence, persuasion transparency information will have a more pronounced effect on persuasion awareness. Future research should evaluate the effect of suggestive content and persuasion transparency information that explains only persuasion tactics users see. Following this, those who are not assigned suggestive content will not be provided with persuasion transparency information. Persuasion transparency information that describes all three persuasion tactics will be given to those who are assigned to see the three suggestive contents only. Hence, false alarms will be dampened.

In addition, it may be interesting to examine how persuasion transparency information featuring surprising persuasion tactics, such as primacy and recency effect, affects users' persuasion awareness. According to extant research, the presence of persuasion transparency information can enhance individuals' perceived persuasion, since they are less likely to know about the tactics

described in such information (e.g., Kirmani and Zhu 2007; Williams et al. 2004). However, the tactics used in this study would not be surprising to general users. For example, they may already know that "Low in stock" triggers the scarcity effect. Thus, future research should implement more surprising persuasion tactics. For instance, persuasion transparency information can feature primacy or recency effects. If the primacy effect is explained, the future research should investigate its impact on users' persuasion awareness and the likelihood that the products in the top rows are selected or considered by users. For the recency effect, the probability of the products in the bottom rows are chosen or considered by users. The surprising tactics could have a stronger effect on perceived persuasion.

Moreover, this study adds warning messages to persuasion transparency information without giving any advice as to how to deal with persuasion tactics. According to Xiao and Benbasat (2015), advice is important to help users correctly detect a biased recommendation. Following their study, future research should investigate design strategies to deal with persuasion tactics and evaluate its effect on users' persuasion awareness and responses. I expect that it will help reduce false alarms and increase users' persuasion knowledge simultaneously. Persuasion transparency information that explains persuasion tactics and features warning messages and advice will be an effective design for online users.

Furthermore, I hypothesize that transparency mode will play a role in online users' persuasion awareness, and subsequent perceptions and behaviors in Chapter 3: section 3.3.2.6. Transparency mode refers to the timing of transparency information is given to users. In this study, persuasion transparency information is provided before users are exposed to suggestive content. Future studies may want to explore if transparency information is provided after users see suggestive content,

will this influence users' perceived costs in interacting with an online entity? Or, if transparency

information requires users to click to view, will this affect users' persuasion awareness differently?

Chapter 6: Conclusion

6.1   Summary of Thesis

Persuasion practices are embedded throughout online platforms. However, these practices can influence users without their awareness of being influenced. Owing to the revelation of Facebook's targeted ads sponsored by the Russian government during the 2016 US presidential election, public concern regarding actual intent and sponsored agents of these practices are rising. With the growth of technologies, online entities get more insights about their users. These insights help the entities design features, such as personalized recommendations, to influence users more effectively. Nevertheless, users may not be aware of those features attempting to persuade them. Instead, they may perceive assistance from the entities when interacting with the features. Thus, the possibility of being persuaded without awareness will increase. According to the Persuasion Knowledge Model (PKM, Friestad and Wright 1994), when an individual interprets an attempt as persuasion, she will be more likely to perform a careful evaluation of such an attempt. This suggests that user awareness of persuasion can contribute to informed judgment and decision-making. As a result, this thesis studies users' persuasion awareness in online settings, as it is important to shape their informed evaluations and decisions.

To better understand this particular domain, I addressed the three research questions:

1. What are the key features of persuasive design which influence online users' persuasion awareness?

Drawing on Decision Support Systems (DSS) literature (Silver 2006) and Toulmin (2003)'s model of argumentation, I determine a typology of persuasive design feature (PDF) in Chapter 3. As

defined in the typology, two *forms* can enable persuasion and affect users' persuasion awareness—*suggestive* and *supportive* form. Also, I specify three dimensions detailing specific ways in which the suggestive form can be carried out—*content*, *mode*, and *invocation style*.

2. How do persuasive design features affect users' persuasion awareness and behavioral responses?

In chapter 3, I develop an integrated theoretical model of online users' persuasion awareness. Integrating PKM, persuasion awareness (Campbell 1995; Robertson and Rossiter 1974), and personalization (e.g., Komiak and Benbasat 2006) literature, I explain how the two forms and the three dimensions of the suggestive form shape users' persuasion awareness—perceived persuasion and perceived assistance beliefs that are the main constructs of persuasion awareness. In other words, different PDFs will affect users' interpretation of PDFs as persuasive and/or assistive. Also, these PDFs will influence perceived user costs in interacting with PDFs and perceived agent costs in delivering PDFs. The four perceptions will shape users' overall evaluation of PDFs, namely perceived appropriateness, and thus cognitive responses (i.e., reactance, attitudes). Also, perceived persuasion and perceived assistance will enhance users' careful evaluations, objective responses. As a result, the proposed model explains how PDFs trigger users' persuasion awareness and subsequent responses.

To investigate the effect of suggestive *content* on persuasion awareness, I conducted empirical study 1 in an e-commerce context (Chapter 4). In this study, two main elements of suggestive content are manipulated—*claim* and *data*. Also, their two combinations—claim and data (C & D) and data supporting a claim (D → C) are explored. Claim and data provision features a claim and data as separate components without any linking words. The provision of supporting a claim with

data features a claim together with data as its support. In this case, linking words are used to clearly convey the supporting role of data. Results support that the presence of either a claim or data increases perceived persuasion, whereas only the presence of data strengthens perceived assistance. Adding data to a claim, or supporting a claim with data, does not increase perceived persuasion. However, providing data as a support to a claim increases perceived assistance, while adding data to a claim does not. Also, data provision increases perceived personalization, which, in turn, affects perceived assistance and perceived agent costs.

Additional results from the structural path model provide evidence that perceived persuasion decreases perceived appropriateness, while perceived assistance and perceived agent costs increase it. Perceived assistance and perceived agent costs show stronger effects on perceived appropriateness than perceived persuasion. Perceived appropriateness influences cognitive responses, including reactance, attitudes towards an online entity, and intention to interact with an entity in the future. Also, in terms of careful evaluations of a product with suggestive content, only perceived persuasion increases the likelihood that a targeted product is considered and selected. That is, when users are aware of persuasion, they are likely to consider a targeted product featuring suggestive content and select it. Thus, it appears that perceived persuasion can drive careful evaluations of a product with suggestive content.

In sum, empirical study 1 offers support to how suggestive content, specifically claim, data, and their combinations, shapes users' persuasion awareness, as well as cognitive and objective responses.

3. What are the mechanisms which improve users' persuasion awareness?

The design of transparency mechanisms is detailed in Chapter 3. Based on PKM and relevant persuasion literature (Petty and Cacioppo 1986b), transparency mechanisms can be defined along two dimensions. First, online entities can provide transparency *information,* including *persuasion* (tactics), persuasion *target*, persuasion *agent*, and *topic* transparency information. Secondly, the entities can present persuasion transparency in the following timing—*advance* (before PDFS exposure), *delayed* (after PDFs exposure), *active* (upon users' requests), and *passive* (concurrent with PDFs). Also, I explain how different types of transparency information and timings will affect users' perceived persuasion, perceived assistance, and perceived user costs differently.

In empirical study 2 (Chapter 5), I design specific persuasion transparency information and examine its impact on persuasion awareness in the context of e-commerce. Based on Williams et al. (2004), Cialdini (1983), and Xiao and Benbasat (2015), I define possible persuasion tactics an online entity can adopt with warning messages. Specifically, empirical study 2 extends empirical study 1 by adding persuasion transparency information in an advanced mode. Persuasion transparency information is given before users encounter suggestive content. Results provide additional support for the impact of suggestive content on persuasion awareness. Also, persuasion transparency information enhances users' perceived persuasion and dampens perceived assistance for all users, regardless of suggestive content they receive. This suggests that persuasion transparency reveals the actual intent of an online entity. However, with persuasion transparency information, those who do not see suggestive content manipulation also have higher perceived persuasion and lower perceived assistance. This indicates false alarms when suggestive content is not given. Overall, this study shows that in addition to suggestive content, persuasion transparency information can strengthen or dampen users' persuasion awareness.

The answers to the above questions should be of interest to researchers, online platforms, and consumer protection organizations.

6.2   Contributions

6.2.1   Theoretical Contributions

From a theoretical perspective, the major contributions of this thesis are four-fold. First, this thesis advances understanding of persuasion awareness in online settings by proposing an integrated theoretical model and determining a typology that captures key characteristics of persuasive design features (PDF) that trigger persuasion awareness and behavioral responses. In particular, based on the DSS research, I specify a PDF as a technological determinant of persuasion awareness. According to the proposed typology, I determine two forms of PDF, suggestive and supportive form. Contrary to Silver (2006) that focuses on three types of decisional guidance, suggestive, quasi-suggestive, and information, I reconceptualize the suggestive form such that it ranges from not-suggestive to quasi-suggestive to suggestive. In this way, it better captures suggestive form of PDF. Also, I add the supportive form to facilitate persuasion and influence persuasion awareness. For the suggestive form, I employ Toulmin's model of argumentation (2003) to detail suggestive content and DSS research to define its mode and invocation style.

Secondly, this thesis employs Toulmin (2003)'s argumentation elements to design suggestive content in different ways. Unlike the original model that requires at least a claim and data, this thesis focuses on individual claim and data content separately and in combinations. In empirical study 1, I evaluate the effect of suggestive content on persuasion awareness in an e-commerce setting. This study informs that suggestive content influences persuasion awareness, although a claim or data is presented separately. Also, it highlights the importance of how suggestive content

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combinations are constructed. Specifically, providing data to support a claim is different from adding data to a claim. Although both constructions do not enhance perceived persuasion, only the former construction increases perceived assistance. Therefore, this thesis serves as a stepping-stone to understand how suggestive content construction, in addition to its presence, can influence persuasion awareness.

Thirdly, this thesis provides empirical evidence that perceived persuasion does not always lead to resistance, as PKM posits. The findings from empirical study 1 indicate that perceived persuasion drives targeted product selection and consideration. That is, when a user perceives persuasion of an online entity, she ends up choosing the targeted product with suggestive content and considering that product more. This supports the PKM's proposition. Perceived persuasion will lead to careful evaluation of the target. If individuals see the target fits their preferences, they will accept it. It appears that perceived persuasion promotes informed judgment and decision-making. As a result, this thesis serves as an initial step in promoting informed evaluations and decisions.

Finally, combining PKM and relevant persuasion literature (Petty and Cacioppo 1986b), this thesis systematically designs how transparency mechanisms can be implemented and thus influence persuasion awareness. In empirical study 2, persuasion transparency information is empirically tested. Extending Williams et al. (2004), I follow Xiao and Benbasat (2015) to add warning messages to persuasion transparency information. This thesis lends support that the presence of persuasion transparency increases perceived persuasion even further and decreases perceived assistance. Consistent with Xiao and Benbasat (2015), the presence of persuasion transparency information can create false alarms for those who do not encounter suggestive content.

Consequently, this thesis suggests a specific way in which persuasion awareness can be elevated and dampened.

6.2.2 Practical Contributions

From a practical standpoint, there are two major contributions. First, this thesis offers a useful guideline to design suggestive content in online platforms to influence users and make them better informed. According to the findings of empirical study 1, providing data to support a claim is a better design to influence and inform users at the same time. In this case, users feel persuasion and perceive assistance of online entities. This also improves targeted product click-through rates and selection.

Secondly, this thesis provides a concrete guideline to develop online platforms that promote users' being better informed about persuasion attempts triggered by the platform. Currently, many online platforms, such as Facebook, have been implementing transparency tools (Dua 2017). The proposed theoretical model informs such tool design. Empirical study 2's findings reveal that the presence of persuasion transparency increases perceived persuasion and decreases perceived assistance, since it discloses persuasion tactics and warns users about risks associated with such tactics. Also, persuasion transparency information can stimulate false alarms. Thus, I propose that persuasion transparency information should be given to users who encounter specific persuasion tactics described in that information only to mitigate false alarms.

In conclusion, this thesis enhances the understanding of persuasion awareness in online settings and informs designers of online platforms about the design that improves users' informed evaluations and decisions.

6.3 Limitations and Suggestions for Future Research

Despite both of its theoretical and practical contributions, this thesis has limitations. First, it limits its scope to the suggestive form that is observable content on online platforms. However, non-observable cues, such as product placement (Haugtvedt and Wegener 1994; Miller and Campbell 1959), and subliminal cues, such as a targeted brand presented as a flashing background (Mandel and Johnson 2002), can enable persuasion and are less likely to make users aware of them. Accordingly, the proposed model may not be generalizable to the non-observable and subliminal cues. It seems that these cues take a different route to persuasion. As such, they might not be cognitively persuasive and/or assistive. Thus, future research may interest to explore how these cues affect users' persuasion awareness and subsequent responses.

Secondly, empirical study 1 presents one to two (in combinations) forms of suggestive content to each user. Nevertheless, multiple content elements have been employed in online platforms. For example, Booking.com features multiple content elements, such as "Only 1 room like this left on our site," "Booked 3 times in the last 6 hours," and "2 people are looking" all at the same time. In this thesis, I do not evaluate the effect of the number of suggestive contents on users' persuasion awareness. As this thesis serves as an early effort to test the impact of suggestive content on persuasion awareness empirically, I focus only on single content that is useful towards understanding the impact of each content. Although empirical study 1 illustrates that combinations of a claim and data do not increase perceived persuasion, future research may investigate whether this holds for more than two suggestive content elements. Shu and Carlson (2014) found that the optimal number of positive claims about a product was three. If there were more than three positive claims given, individuals perceived higher perceived persuasion. Also, it is interesting to define

the optimal number of suggestive contents that triggers both the highest perceived persuasion and the highest perceived assistance. Since perceived persuasion can shape users' careful evaluation of the targeted product, heightened perceived persuasion is good for users' judgment. However, perceived persuasion decreases perceived appropriateness and subsequent positively cognitive responses. Identifying the optimal number that yields both increased persuasion and assistance will benefit both users and platforms.

Finally, this thesis only examines the effect of suggestive content using an e-commerce website and targets only desktop users. As desktop and mobile users adopt different strategies in interacting with the website (Lee and Benbasat 2010), the generalizability of the findings of empirical study 1 and 2 might be limited. However, I expect that the impact of suggestive content for mobile users on perceived assistance will be more pronounced. Since mobile users spend more cognitive effort in processing information (Lee and Benbasat 2010), they will be more likely to rely on peripheral cues such as suggestive content based on ELM (Petty and Cacioppo 1986b). According to PKM, mobile users with limited cognitive capacity will be less likely to interpret suggestive content as persuasion. Also, persuasion transparency information operationalized in empirical study 2 will not be appliable for mobile interface. These users may not read long messages describing persuasion tactics. Thus, it is interesting to present only particular persuasion tactics user encounter, rather than disclose all tactics online entities might use as in empirical study 2. In sum, future research can test the proposed model in different contexts.

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Appendices

Appendix A Examples of Persuasion Awareness Research

Reference	Antecedents/ Moderators	Antecedents/Moderators Operationalization	Process	Mediators Operationalization	Behavioral Responses	Outcome Operationalization	Persuasion Awareness Theories
Robertson and Rossiter (1974)	- Individuals' characteristics - Persuasion knowledge - Agent knowledge - Topic knowledge	- Developmental factors (e.g., age) - Discrimination between programs and commercials, perception of audience, and awareness of the symbolic nature of commercials - Recognition of source - Perception of discrepancy	- Perceived assistive intent - Perceived persuasive intent	- Perceived assistive intent - Perceived persuasive intent	- Agent knowledge - Attitudes toward agents - Behavioral intention	- Trust in commercials - Liking of commercials - Consumption motivation	- Attribution theory

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Reference	Antecedents/ Moderators	Antecedents/Moderators Operationalization	Process	Mediators Operationalization	Behavioral Responses	Outcome Operationalization	Persuasion Awareness Theories
		between message and product					
Campbell (1995)	- Timing of agent information - Content of persuasion attempts	- Attention-getting ad tactics (mystery ads vs. borrowed interest appeal)	- Perceived assistive intent - Perceived persuasive intent - Perceived target costs - Perceived agent costs	- Perceived personal benefits - Perceived agent benefits - Perceived personal costs - Perceived agent costs	- Perceived appropriateness	- Inferences of manipulative intent	- Equity theory
Campbell and	- Timing of persuasion attempts	- Timing of flattery (prior vs. after the	- Perceived persuasive intent	- Inference of persuasion motives	- Attitudes toward agents	- Perceived salesperson sincerity	- Persuasion knowledge model

Reference	Antecedents/ Moderators	Antecedents/Moderators Operationalization	Process	Mediators Operationalization	Behavioral Responses	Outcome Operationalization	Persuasion Awareness Theories
Kirmani (2000)	- Persuasion information - Cognitive capacity	purchase decision) - Providing information regarding general persuasion tactics - Cognitive capacity					
Williams et al. (2004)	- Agent information	- Providing information regarding the source of intent questions (control vs.	- Perceived persuasive intent	- Persuasion knowledge	- Actual behaviors	- Behaviors suggested by the intention questions	- Persuasion knowledge model

Reference	Antecedents/ Moderators	Antecedents/Moderators Operationalization	Process	Mediators Operationalization	Behavioral Responses	Outcome Operationalization	Persuasion Awareness Theories
		intent-only vs. sponsored-objective source vs. sponsored-self intended source) - Cognitive capacity - Change of meaning					
	- Cognitive capacity - Persuasion information						
Hibbert et al. (2007)	- Perceived persuasive intent - Agent knowledge	- Ad tactics skepticism and perceived manipulative intent - Ad credibility, affective			- Behavioral intention	- Donation intention	- Persuasion knowledge model

Reference	Antecedents/ Moderators	Antecedents/Moderators Operationalization	Process	Mediators Operationalization	Behavioral Responses	Outcome Operationalization	Persuasion Awareness Theories
		evaluations of the charity, and beliefs about the charity					
Kirmani and Zhu (2007)	- Agent information - Content of persuasion attempts - Individuals' characteristics	- Providing information regarding the source of message - Type of comparison (complete vs. incomplete comparison) vs. high) - Regulatory focus	- Perceived persuasive intent	- Persuasion knowledge	- Attitudes toward agents - Attitudes toward products	- Brand evaluation - Perceived quality	- Persuasion knowledge model

Reference	Antecedents/ Moderators	Antecedents/Moderators Operationalization	Process	Mediators Operationalization	Behavioral Responses	Outcome Operationalization	Persuasion Awareness Theories
	- Persuasion information	(prevention s. promotion) - Externally priming suspicion (article about fraud)					
Wei et al. (2008)	- Agent information - Perceived appropriatenes	- Warning of the brand paid for the show (telling a brand paid for the show vs. telling nothing vs. forewarning) - Perceived appropriateness			- Attitudes toward agents	- Consumer response to brands	- Persuasion knowledge model - Covert marketing

Reference	Antecedents/ Moderators	Antecedents/Moderators Operationalization	Process	Mediators Operationalization	Behavioral Responses	Outcome Operationalization	Persuasion Awareness Theories
	s of persuasion attempts - Agent knowledge	of covert marketing - Brand familiarity					
Cowley and Barron (2008)	- Format explicitness of persuasion attempts - Agent knowledge - Persuasion information	- Product placement (prominent vs. subtle) - Program liking - Persuasive-intent prime before viewing			- Attitudes toward agents	- Brand attitudes	- Persuasion knowledge model
Tutaj and van Reijmersdal (2012)	- Format explicitness of persuasion attempts	- Online advertising formats (subtle-sponsored			- Perceived assistive intent	- Perceived ad information and perceived ad amusement	- Persuasion knowledge model

Reference	Antecedents/ Moderators	Antecedents/Moderators Operationalization	Process	Mediators Operationalization	Behavioral Responses	Outcome Operationalization	Persuasion Awareness Theories
		content vs. prominent-banner ads)			- Perceived persuasive intent	- Perceived ad irritation	
Jeong and Lee (2013)	- Content explicitness of persuasion attempts - Individuals' characteristics	- Recommendation type (alternative brands only vs. additional products only vs. both alternative brands and additional products	- Perceived assistive intent - Perceived persuasive intent	- Consumer inference of consumer-motive of marketers - Consumer inference of firm-serving motive of marketers	- Attitudes toward agents	- Attitude toward the website	- Persuasion knowledge model

Reference	Antecedents/ Moderators	Antecedents/M oderators Operationalizat ion	Process	Mediators Operationaliz ation	Behavioral Responses	Outcome Operationaliz ation	Persuasion Awareness Theories
		- Interpersonal trust					
Martin and Strong (2016)	- Content explicitness of persuasion attempts	- Conclusion explicitness advertising (implicit vs. open-ended vs. explicit, closed-ended conclusions)	- Perceived persuasive intent	- Persuasion awareness	- Agent knowledge - Attitudes toward agents	- Trust - Brand evaluation	- Conclusion explicitness - Persuasion knowledge model

Table 76. Examples of persuasion awareness research

Appendix B Examples of Persuasive Design Features Adopted by Various Online Entities

Example(s) from Fields	Manipulation of Suggestive Form (Silver 2006)	Argument Element(s) (Toulmin 2003)	Manipulation of Elements (Toulmin 2003)	Manipulation of Modes (Silver 2006)	Manipulation of Invocation Styles (Silver 2006)
Watch now (Apple TV) Watch it again (Netflix)	Suggestive	Claim	Claim – action	Personalized	Automatic
Recommended (YouTube) For [username] (Netflix) Top pick for you (Netflix)	Suggestive	Claim	Claim – recommendation	Personalized	Automatic
Editorial recommendations (Amazon)	Suggestive	Claim + data	Claim – recommendation + data (editor)	Non-personalized	Automatic
We just added a movie you might like (Netflix)	Suggestive	Claim + qualifier (might, will)	Claim – conclusion + qualifier (might, will)	Personalized/non-personalized	Automatic

Example(s) from Fields	Manipulation of Suggestive Form (Silver 2006)	Argument Element(s) (Toulmin 2003)	Manipulation of Elements (Toulmin 2003)	Manipulation of Modes (Silver 2006)	Manipulation of Invocation Styles (Silver 2006)
Save on Apple products they'll love! (Costco)					
Great value (Booking)	Suggestive	Claim	Claim – conclusion	Non-personalized	Automatic
Amazon's choice (Amazon)	Suggestive	Claim	Claim – standpoint	Non-personalized	Automatic
Frequently bought together (Amazon)	Quasi-suggestive	Data	Data	Non-personalized	Automatic
Booked [number] times for your dates in the last [number] hours (Booking) What are people watching in your area? (Netflix)	Quasi-suggestive	Data	Data	Non-personalized	Automatic
[Number] other persons looked for	Quasi-suggestive	Data	Data	Non-personalized	Automatic

Example(s) from Fields	Manipulation of Suggestive Form (Silver 2006)	Argument Element(s) (Toulmin 2003)	Manipulation of Elements (Toulmin 2003)	Manipulation of Modes (Silver 2006)	Manipulation of Invocation Styles (Silver 2006)
your dates in the last xx minutes (Booking)					
Only [number] rooms left! (Booking)	Quasi-suggestive	Data	Data	Non-personalized	Automatic
Limited time deal (Amazon)	Quasi-suggestive	Data	Data	Non-personalized	Automatic
Bestseller (Amazon, Booking)	Quasi-suggestive	Data	Data	Non-personalized	Automatic
Customers who searched for xx ultimately bought (Amazon)	Quasi-suggestive	Data	Data	Non-personalized	Automatic
Inspired by your browsing history (Amazon)	Quasi-suggestive	Data	Data	Personalized	Automatic

Example(s) from Fields	Manipulation of Suggestive Form (Silver 2006)	Argument Element(s) (Toulmin 2003)	Manipulation of Elements (Toulmin 2003)	Manipulation of Modes (Silver 2006)	Manipulation of Invocation Styles (Silver 2006)
Inspired by your recent shopping trends (Amazon)					
Because you watched [movie name] (Netflix)	Quasi-suggestive	Data	Data	Personalized	Automatic
[Percentage number] % match (Netflix)	Quasi-suggestive	Data	Data	Personalized	Automatic

Table 77. Examples of persuasive design feature adopted by various online entities

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Appendix C Definition of the Constructs in a Theoretical Model

Construct	Definition	Theoretical Framework
Persuasive design feature (PDF)	A component of an online entity which influences and facilitates users to perform a targeted outcome	
Form	What a PDF an online entity offers to users	Decisional guidance (Silver 1990, 1991, 2006)
Suggestive form	The degree to which an online entity provides an explicit direction on what to do to users, ranging from not suggestive to quasi-suggestive, to suggestive	
- Suggestive PDF	A component of an online entity that offers an explicit direction concerning what to do to users	
- Quasi-suggestive PDF	A component of an online entity that does not give an explicit direction on what to do to users, but from which users can infer a direction	
- Not-suggestive PDF	A component of an online entity that does not offer an explicit or implicit direction regarding what to do to users	
Supportive form	A function that an online entity offers to support users' evaluations and decisions	
Content of the suggestive form	What content the suggestive form features	Toulmin's model of argument (Toulmin 1958, 2003)

Construct	Definition	Theoretical Framework
Claim	The suggestive form of PDF that features a conclusion, action, recommendation, or standpoint	
Data	The suggestive form of PDF that features a fact	
Warrant	The suggestive form of PDF that features a proposition linking data with a claim	
Backing	The suggestive form of PDF that features information used to explain why a warrant or data should be accepted	
Mode of the suggestive form	How the suggestive form of PDF is constructed	Decisional guidance (Silver 2006)
Non-personalized	Content of the suggestive form that is predefined by an online entity	
Personalized	Content of the suggestive form that is based on learning user preferences.	
Invocation style of the suggestive form	How the suggestive form of PDF is triggered	Decisional guidance (Silver 2006)
Automatic	The suggestive form of PDF that is given automatically	
On-demand	The suggestive form of PDF that is triggered upon users' request	
Persuasion awareness	Users' perception that an online entity tries to influence them	Persuasion knowledge model (Friestad and Wright 1994)
Perceived persuasion beliefs	Users' perception that an online entity tries to persuade them to fulfill its goal	

Construct	Definition	Theoretical Framework
- Perceived persuasive intent of an online entity	Users' perception that an online entity persuades them	
- Perceived agent benefits	Users' perception that an online entity benefits from them	
Perceived assistance beliefs	Users' perception that an online entity helps them to fulfill their own goal	
- Perceived assistance intent of an online entity	Users' perception that an online entity tries to help them	
- Perceived user benefits	Users' perception that they benefit from interacting with an online entity	
Other relevant perceptions	Users' perception that affects an overall evaluation of PDF	Equity theory (Campbell 1995)
Perceived user costs	Users' perception of their attention, processing effort, or involvement used in processing a PDF	
Perceived agent cost	Users' perception of an online entity's time or effort used in delivering a PDF	
Perceived personalization	The degree to which users perceive that an online entity understands and represents their needs	Personalization
Perceived appropriateness of an online entity that designs PDF	Users' perception that an entity that provides a PDF is acceptable	

Construct	Definition	Theoretical Framework
Transparency mechanisms	Specific ways in which an online entity can be designed to influence the degree to which users are aware of being influenced	Persuasion knowledge model (Friestad and Wright 1994)
Transparency information	Information which transparency mechanisms provide to influence user's perception of being persuaded	
Persuasion information	Information concerning persuasion tactics used in a PDF	
Persuasion target information	Information regarding targets of a PDF	
Agent information	Information regarding an online entity or a sponsor	
Topic information	Information regarding a topic of persuasion	
Transparency timing	How transparency mechanisms are triggered	
Advance	Transparency information that is given before users' exposure to a PDF	
Delayed	Transparency information that is present after users' exposure to a PDF	
Active	Transparency information that is shown upon users' request	
Passive	Transparency information that is available together with a PDF	
Behavioral Responses	Users' responses to a PDF	Persuasion knowledge model (Friestad and Wright 1994)
Cognitive responses	Users' cognitive responses to a PDF, such as resistance, attitudes towards the design of an	

Construct	Definition	Theoretical Framework
	online entity, and intention to interact with an online entity	
Objective responses	Users' observable responses to a PDF, such as careful evaluation of a PDF, acceptance, and rejection	
User knowledge	Users' beliefs	Persuasion knowledge model (Friestad and Wright 1994)
Persuasion knowledge	Users' beliefs regarding persuasion tactics an online entity employs	
Agent knowledge	Users' beliefs concerning an online entity's competencies and goals (competent and benevolent trusting belief)	
Topic knowledge	Users' beliefs regarding the topic of persuasion	

Table 78. Construct definitions

Appendix D Summary of Hypotheses

No	Hypotheses
	Persuasion awareness and behavioral responses
H1	Perceived persuasion of online entities will decrease perceived appropriateness of online entities that provide PDFs.
H2	Perceived assistance of online entities will increase perceived appropriateness of online entities that provide PDFs
H3	Perceived user costs will decrease perceived appropriateness of online entities that provide PDFs.
H4	Perceived agent costs will increase perceived appropriateness of online entities that provide PDFs.
H5	Perceived appropriateness of online entities that provide PDFs will increase users' positively cognitive-behavioral responses.
H6	Perceived persuasion of online entities will increase users' objective-behavioral responses.
H7	Perceived assistance of online entities will promote users' objective-behavioral responses.
	Effects of PDF forms on persuasion awareness
H8	Online entities that provide suggestive PDFs will increase users' perceived persuasion.
H9	The effect of the suggestive form of PDFs on users' perceived persuasion will be amplified when users are provided with the supportive form.
H10	Online entities that provide the suggestive form of PDFs will increase users' perceived assistance.
H11	Online entities that provide the supportive form of PDFs will increase users' perceived assistance.
H12	Online entities that provide the suggestive form of PDFs will increase users' perceived personalization.
	Effects of the content *of suggestive form* on persuasion awareness
H13a	For the content of the suggestive form, online entities that provide the claim-only (C) PDFs will enhance users' perceived persuasion of such entities more than those that provide the data-only (D) PDFs.

No	Hypotheses
H13b	Online entities that add content(s) to a claim PDF (e.g., C + D, C + D + B, C+ D +W, C + D + B + W) will not increase users' perceived persuasion of such entities.
H14a	Online entities that add data only (C + D) to the claim content will strengthen users' perceived assistance of such entities more than those that provide PDFs with claim-only (C) and data-only (D) content.
H14b	Online entities that add both data and backing (C + D + B) to the claim content will strengthen users' perceived assistance of such entities more than those that provide PDFs with claim-only (C) and data-only (D) content.
H14c	Online entities that add warrant to the suggestive form of PDFs (C + D + W and C + D + B + W) will not increase users' perceived assistance of such entities than those without a warrant (C + D and C + D +B).
	Effects of modes of suggestive form on persuasion awareness
H15	Online entities that provide personalization will increase perceived personalization than those that do not provide personalization.
H16	Perceived personalization will enhance perceived assistance.
H17	Perceived personalization will increase perceived agent costs.
H18	Perceived personalization will decrease perceived user costs.
	Effects of invocation styles of suggestive form on persuasion awareness
H19	Online entities that employ the on-demand style will increase users' perceived persuasion than those employing the automatic style.
H20	Online entities that employ the on-demand style will increase users' perceived user costs than those employing the automatic style.
	Effects of transparency information on persuasion awareness
H21a	Persuasion transparency will increase users' perceived persuasion.
H21b	Target transparency will increase users' perceived persuasion.
H21c	Agent intent transparency will increase users' perceived persuasion.
H22a	Persuasion transparency will decrease users' perceived assistance.
H22b	Target transparency will decrease users' perceived assistance.

No	Hypotheses
H22c	Agent intent transparency will decrease users' perceived assistance.
H23a	Agent background transparency will increase users' perceived assistance.
H23b	Topic transparency will increase users' perceived assistance.
	Effects of transparency timing on persuasion awareness
H24	Online entities that provide transparency information to users before they encounter PDFs (advance) will amplify their perceived persuasion more than those providing transparency information after users see PDFs (delayed), at the same time as they are exposed to PDFs (passive), and upon users' request (active).
H25	Online entities that provide transparency information to users before they encounter PDFs (advance) will amplify their perceived assistance more than those providing transparency information after users see PDFs (delayed), at the same time as they are exposed to PDFs (passive), and upon users' request (active).
H26	Online entities that provide transparency information to users after they see PDFs (delayed) and upon users' requests (active) will increase perceived user costs.
	Effects of user knowledge on persuasion awareness
H27a	Users' agent will dampen their perceived persuasion.
H27b	Users' topic knowledge will dampen their perceived persuasion
H27c	Users' persuasion knowledge will enhance perceived persuasion.
H28a	Users' agent knowledge will increase their perceived assistance.
H28b	Users' topic knowledge will increase their perceived assistance.
H28c	Users' persuasion knowledge will decrease perceived assistance.

Table 79. Summary of hypotheses

Appendix E Pretests for Empirical Study 1

E.1   Task Product Pretest

One factor which would have a significant impact on users' interpretation of persuasive website design feature is the type of product. As prior literature found, consumers' behaviors such as information search and purchase are influenced by the products (Dimoka et al. 2012; Huang et al. 2009). Information search is critical to users' interpretation of website feature. This is supported by Huang et al. (2009) and Dimoka et al. (2012) which explore the impact of product information presentations (e.g., product picture, consumers' review) and the product type in terms of the experience-search dimension. They found the experience-search type of product influenced the individuals' behaviors. This suggests that the type of task product would moderate the effect of persuasive website feature on users' persuasion awareness and behavioral responses. Thus, I control for this type of task product in my experiment.

Nelson (1970) proposes one dimension of product which has received much attention, experience-search. The experience-search dimension focuses on the degree to which the individuals are able to assess the overall product or the product attributes before making purchase. According to Huang et al. (2009), a product has both search and experience attributes. Thus, overall perception of experience and search quality of the product is the way to differentiate the search from the experience product. Accordingly, search products refer to "those for which the attributes most important to assessing product quality are generally discoverable without the consumer (or someone else) interacting with the product" and experience products are "those for which attributes associated with product quality are most discoverable through experience with the product" (Huang et al. 2009, p. 57). Table 80 shows examples of experience and search products tested in prior research. Prior research on persuasion awareness used several task products which vary in

terms of the experience-search dimension. Table 81 presents examples of task products used in extant research on persuasion awareness.

Experience Product		Search Product	
Product	**Source(s)**	**Product**	**Source(s)**
Music CD	Weathers et al. (2007) Mudambi and Schuff (2010)	Natural supplement pills	Weathers et al. (2007)
MP3 player	Weathers et al. (2007) Mudambi and Schuff (2010)	Lawn fertilizer	Weathers et al. (2007)
Water skis	Weathers et al. (2007)	Printer	Weathers et al. (2007) Mudambi and Schuff (2010)
Sunglasses	Weathers et al. (2007)	Water purifier	Weathers et al. (2007)
Recliner	Weathers et al. (2007)	Radar detector	Weathers et al. (2007)
Mattress	Weathers et al. (2007)	Shoes	Huang et al. (2009)
Automotive parts and accessories	Huang et al. (2009)	Home furniture	Huang et al. (2009)
Health and beauty products	Huang et al. (2009)	Garden and patio implement	Huang et al. (2009)
Camera equipment	Huang et al. (2009)	Cell phone	Mudambi and Schuff (2010)
Video game	Mudambi and Schuff (2010)	Digital camera	Mudambi and Schuff (2010)

Table 80. Examples of experience and search products in extant literature

Task Product(s)	Source(s)
Apparel	Campbell and Kirmani (2000)
Digital camera	Kirmani and Zhu (2007)
Shampoo	Cowley and Barron (2008)

Task Product(s)	Source(s)
Candy Potato chips Diet coke	
Mac and cheese Running shoes Fashion apparel	Wei et al. (2008)
Tablet	Tutaj and van Reijmersdal (2012)
Multi-media speaker	Jeong and Lee (2013)
Digital camera Gym subscription	Martin and Strong (2016)
Apparel Ticket Electronics	Pöyry et al. (2017)

Table 81. Examples of task products used in prior persuasion awareness research

Objective. This pretest aimed at identifying two task products, one with high experience and another with high search quality.

Method. A 5 (*product*: electric toothbrush, wireless headphone, digital bathroom scale, blender, portable charger) within-subjects design was conducted. I selected five products available on Bestbuy.com. The five products had a moderate level of attribute complexity (5 – 9 attributes) based on Miller (1956) and Xu et al. (2014). I considered only the products with at least 40 alternatives in the price range from $1 to $100. This expects to demand participants' effort in evaluating a product and thus make the effect of persuasive design feature, a peripherical cue, in the main study of study 2 more pronounced, as ELM suggests that individuals will be more likely to rely on peripheral cues when their cognitive capacity is limited (Petty and Cacioppo 1986a, b). The products include an electric toothbrush, a wireless headphone, a digital bathroom scale, a

blender, and a portable charger. Participants were asked to evaluate these five products in random order. The evaluation was based on their perception regarding search-experience quality and subjective product knowledge.

Measurement. The measurement items are presented in Table 82.

Construct	Item	Response	Source(s)
Product attribute evaluation	How is each attribute important to you?	Product attributes	
Product attribute ranking	Please rank the following [product] attributes in order of the importance to your purchasing decision (the most important attribute at the top):	Product attributes	
Brand preferences	Which brands of the [product] do you like? Select ALL that apply.	Product brands	
Perceived experience-search product	To what extent do you agree or disagree with the following statements:	1 = Strongly disagree to 7 = Strongly agree	Weathers et al. (2007) and Huang et al. (2009)
	It is important for me to experience [the product] to evaluate how good it will be.		
	It is difficult for me to evaluate the quality of [the product] before experiencing it.		
	I can adequately evaluate [the product] using only information provided by the website about [the product]'s attributes and features.		

Construct	Item	Response	Source(s)
	I am able to evaluate the quality of [the product] simply by reading information about it.		
Subjective product knowledge	To what extent do you agree or disagree with the following statements:	1 = Strongly disagree to 7 = Strongly agree	Al-Natour et al. (2006)
	I consider myself to be an expert in [the product/topic] presented on [the website].		
	I am knowledgeable about [the product/topic] presented on [the website].		
	I have extensive experience in [the product/topic] presented on [the website].		
Product purchase experience	Have you ever purchased a/an [product] before?	Yes	
		No	
If "Yes"	When did you last purchase a/an [product]?	Less than a month ago	
		In the last 1 – 3 months	
		In the last 4 – 6 months	
		In the last 7 – 9 months	
		In the last 10 – 12 months	

Construct	Item	Response	Source(s)
		More than 12 months ago	
	Which brand of the [product] did you purchase last time?	Open-ended	
	How much did you pay for the [product] last time?	Open-ended	
If "No"	When did you last purchase a/an [product]?	Never	
		Less than a month from now	
		In the next 1 - 3 months	
		In the next 4 - 6 months	
		In the next 7 - 9 months	
		In the next 10 - 12 months	
		More than 12 months from now	
Product use experience	Have you ever used a/an [product]?	Yes	
		No	
If "Yes"	About how often do you use the [product]?	Less than once a week	
		About once per week	

Construct	Item	Response	Source(s)
		About twice per week	
		About three times per week	
		About four times per week	
		About five times per week	
		About six times per week	
		About seven times per week	
		More than seven times per week	

Table 82. Measurement of task product pretest

Participants. Fifty participants were recruited from Amazon's Mechanical Turk. Five participants failed the attention check questions. Thus, they were excluded from the analysis, resulting in 45 usable participants.

Results on subjective product knowledge. I captured participants' subjective product knowledge. The scale reliability of this measure was 0.90, thus having adequate reliability (Nunnally and Bernstein 1994). There was no significant difference in subjective product knowledge across five products, $F(4, 176) = 1.32$, $p = .27$, $\eta_p^2 = .03$ with a small effect size. Therefore, subjective product knowledge will not affect participants' evaluations on experience and search quality of the product.

Results on perceived experience quality. A one-way repeated measures ANOVA was conducted to examine the difference in perceived experience quality among the products. The means and standard deviations are presented in Table 83. Results indicate that participants had different perception regarding experience quality across five products, $F(4, 176) = 13.28$, $p < .001$, $\eta_p^2 = .23$ with a large effect size. The post-hoc analysis using Bonferroni correction shows that the wireless headphone had significantly higher experience quality than the digital bathroom scale, $p < .001$, the blender, $p = .01$, and the portable charger, $p < .001$. The electric toothbrush had significantly higher experience quality than the digital bathroom scale, $p = .001$. Note: 1 – electric toothbrush, 2 – wireless headphone, 3 – digital bathroom scale, 4 – blender, 5 – portable charger

Figure 32 presents the differences in perceived experience quality across five products.

Product	Mean	Standard Deviation
Electric toothbrush	4.18	1.61
Wireless headphone	4.79	1.43
Digital bathroom scale	3.02	1.46
Blender	3.81	1.43
Portable charger	3.18	1.42

Table 83. Means and standard deviations of perceived experience quality in the task product pretest
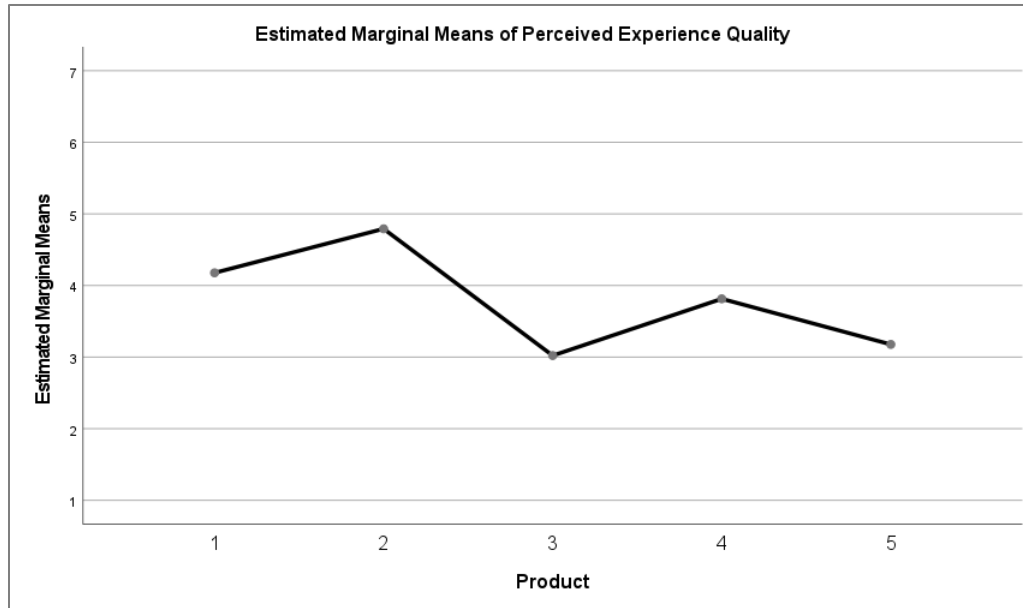
Note: 1 – electric toothbrush, 2 – wireless headphone, 3 – digital bathroom scale, 4 – blender, 5 – portable charger

Figure 32. Differences in perceived experience quality

Results on perceived search quality. A one-way repeated measures ANOVA was conducted to examine the difference in perceived search quality among the products. The means and standard deviations are presented in Table 84. Results indicate that participants had different perception regarding search quality across five products, $F(4, 176) = 11.36$, $p < .001$, $\eta_p^2 = .21$ with a large effect size. The post-hoc analysis using Bonferroni correction shows that the electric toothbrush had significantly higher search quality than the digital bathroom scale, $p < .001$, the blender, $p = .02$, and the portable charger, $p = .01$. The wireless headphone had significantly higher search quality than the digital bathroom scale, $p < .001$, the blender, $p < .001$, and the portable charger, $p = .001$. Figure 33 presents the differences in perceived search quality across five products.

Product	Mean	Standard Deviation
Electric toothbrush	3.88	1.76
Wireless headphone	3.67	1.76
Digital bathroom scale	5.11	1.33

Product	Mean	Standard Deviation
Blender	4.72	1.36
Portable charger	5.00	1.32

Table 84. Means and standard deviations of perceived search quality in the task product pretest
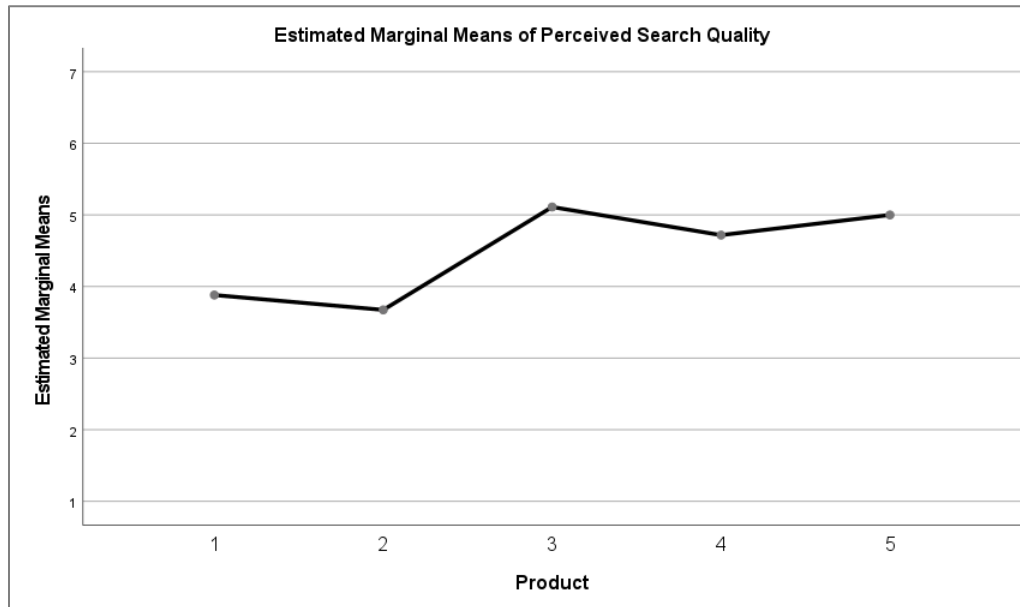
Note: 1 – electric toothbrush, 2 – wireless headphone, 3 – digital bathroom scale, 4 – blender, 5 – portable charger

Figure 33. Differences in perceived search quality in the task product pretest

Note: 1 – electric toothbrush, 2 – wireless headphone, 3 – digital bathroom scale, 4 – blender, 5 – portable charger

Results on perceived experience – search quality. A one-way repeated measures ANOVA was conducted to examine the difference in perceived experience-search quality among the products. This experience-search measure was used in Weathers et al. (2007). In their study, this measure was the difference between the average of perceived experience quality items and the average of perceived search quality items (i.e., experience – search). The smallest difference indicates search quality, while the largest difference reflects experience quality. The means and standard deviations are presented in Table 85. Results indicate that participants had different perception regarding experience-search quality across five products, $F(4, 176) = 13.13$, $p < .001$, $\eta_p^2 = .23$ with a large effect size. The post-hoc analysis using Bonferroni correction shows that the wireless headphone

had significantly higher experience-search quality than the digital bathroom scale, $p < .001$, the blender, $p = .001$, and the portable charger, $p < .001$. The electric toothbrush had significantly higher experience-search quality than the digital bathroom scale, $p < .001$, and the portable charger, $p < .001$. In other words, the wireless headphone had significantly highest experience quality, and the digital bathroom scale had the highest search quality. Figure 34 presents the differences in perceived experience-search quality across five products.

Product	Mean	Standard Deviation
Electric toothbrush	0.30	3.24
Wireless headphone	1.12	2.98
Digital bathroom scale	-2.09	2.62
Blender	-0.90	2.65
Portable charger	-1.82	2.55

Table 85. Means and standard deviations of perceived experience – search quality in the task product pretest
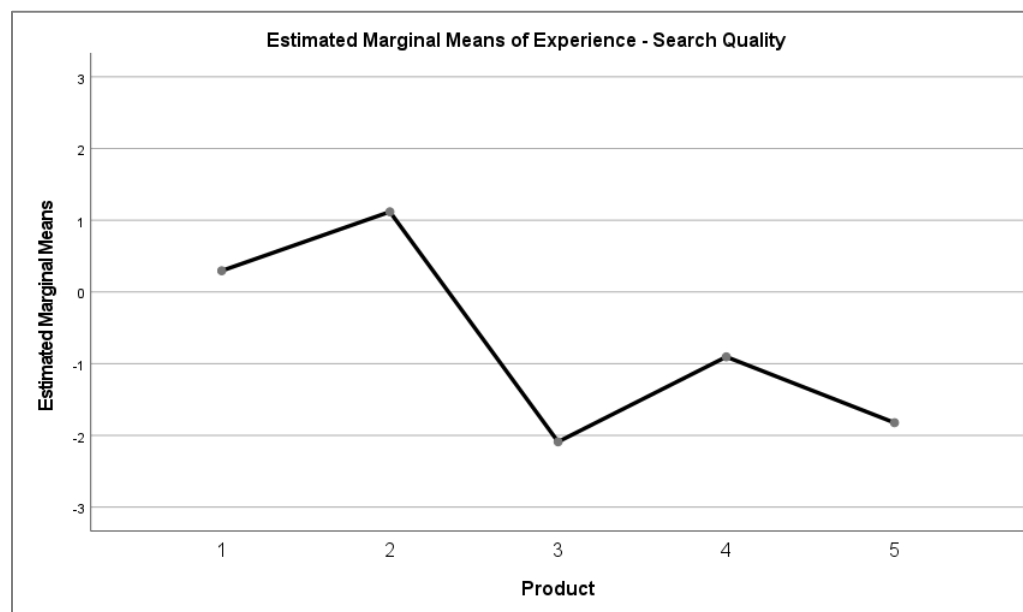
Note: 1 – electric toothbrush, 2 – wireless headphone, 3 – digital bathroom scale, 4 – blender, 5 – portable charger

Figure 34. Differences in perceived experience-search quality

Results on important product attributes. As the wireless headphone had highest experience quality and the digital bathroom scale had the highest search quality, I analyzed attribute evaluation and ranking of the two products and selected nine attributes which participants perceived most important to their decisions. However, for the digital bathroom scale, the number of users in memory and battery did not have variable values. Thus, I chose BMI and body fat percentage measure instead.

Product Attributes	The Wireless Headphone	The Digital Bathroom Scale
Attribute 1	Price	Price
Attribute 2	Brand	Brand
Attribute 3	Headphone fit	Maximum weight capacity (lb)
Attribute 4	Battery life (hr)	Display size (in)
Attribute 5	Battery charge time (hr)	Number of users in memory
Attribute 6	Sound isolating	Battery (battery size and number of batteries required)
Attribute 7	Water resistant	Dimension (HxWxL)
Attribute 8	Weight (g)	Weight (lb)
Attribute 9	Warranty terms (mo)	Warranty terms (mo)

Table 86. Important attributes of wireless headphone and digital bathroom scale in the task product pretest

Conclusion. The task product pretest reveals that the wireless headphone and the digital bathroom scale had more experience quality and more search quality, respectively. That is, the wireless headphone reflects the experience product, whereas the digital bathroom scale exemplifies the search product. However, the wireless headphone would have a stronger brand effect than the digital bathroom scale. Accordingly, I chose the digital bathroom scale as a task product used in the pretests and the main study of empirical study 1.

E.2   Development of an Instrument to Measure Persuasion Awareness in Online Settings

Objective. Extant research has employed different measures for persuasion awareness that would overlap with one another (Ham et al. 2015). Also, most research has not measured extensive persuasion awareness constructs and relevant perceptions in one study, as in this thesis. Hence, their content validity and construct validity do not receive sufficient support. Another concern was the difference between persuasion awareness constructs and existing IS constructs—perceived assistive intent vs. perceived usefulness discussed in TAM, and perceived user costs vs. perceived ease of use in TAM. As a result, this section's objective was to identify and develop an instrument designed to capture various perceptions concerning persuasion awareness in online settings. This instrument is meant to be a tool for persuasion awareness research in this particular setting and used for the main study of empirical study 1 and 2. To create the persuasion awareness instrument, I followed the instrument development process from Moore and Benbasat (1991). This provided initial support to content validity and construct validity of persuasion awareness constructs. Next, the development process is described.

Stage 1: Item Creation

To ensure content validity was the objective of this stage. I identified relevant scales from existing literature and then categorized them into persuasion awareness and relevant constructs I defined in this thesis. A key construct of persuasion awareness is persuasion knowledge. According to PKM, when persuasion knowledge is activated, it will influence individuals' overall evaluation of persuasion attempts (i.e., perceived appropriateness) and behavioral responses (attitudes towards persuasion agents). Prior literature has developed and employed several persuasion knowledge measures (Campbell 1995; Campbell and Kirmani 2000; Friestad and Wright 1995). Developed

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by Friestad and Wright (1994), persuasion knowledge is a multi-dimensional construct, such as beliefs about how a persuasion attempt works and its effectiveness (beliefs about psychological mediators, Friestad and Wright 1995). Persuasion knowledge can be a dispositional or situational factor (Ham et al. 2015). As a dispositional factor, persuasion knowledge focuses on the general tendency to understand persuasion tactics used by persuasion agents (e.g., Obermiller and Spangenberg 1998). It aligns with persuasion knowledge in this thesis that refers to users' existing knowledge on persuasion strategies, a control variable in empirical study 1 and 2. As a situational factor, persuasion knowledge emphasizes user awareness of being persuaded as a result of a persuasion attempt (Campbell 1995). Of particular interest to empirical study 1 and 2 is situational persuasion knowledge that reflects whether an agent is trying to persuade a user through a PDF and transparency information. That is, perceived persuasive intent is a focus. Also, taking PKM, attribution theory, and equity theory, I conceptualize perceived assistive intent, perceived user benefits, perceived agent benefits, perceived user costs, and perceived agent costs as an additional driver of perceived appropriateness and thus behavioral responses. However, some constructs would overlap with each other. Perceived personal benefits from equity theory align with perceived assistive intent from attribution theory, or they would emerge into one higher-order construct or different constructs. This could be the case for perceived agent benefits from equity theory and perceived persuasive intent from PKM and attribution theory. Perceived user benefits align with perceived assistive intent, as they focus on assistance beliefs of an agent. Perceived agent benefits are in line with perceived persuasion beliefs, since they emphasize persuasion perception. Therefore, this thesis includes a more extensive set of persuasion awareness constructs.

Accordingly, I identified examples of measurement scales used in the existing persuasion awareness literature and classified them into 1) persuasion knowledge (dispositional), 2) perceived

persuasive intent (situational), 3) perceived agent benefits 4) perceived assistive intent, 5) perceived user benefits, 6) perceived user costs, 7) perceived agent costs, 8) perceived appropriateness, 9) behavioral responses. See Table 87 for measurement scale examples, their respective construct used in this thesis, and their original constructs.

Next, I selected the scale items that fit my testing context in empirical study 1 and 2, an e-commerce website. An agent, in this case, refers to a website. Thus, I borrowed and adjusted the scale for perceived user benefits, perceived agent benefits, and perceived agent costs from Campbell (1995). Two items of perceived persuasive intent were borrowed and modified from Al-Natour et al. (2006). Also, I developed the three scale items for perceived assistive intent and one scale item for persuasive intent, as the existing scales do not directly tap on perceived assistive intent and lack one item to create three scale items for perceived persuasive intent. To differentiate among perceived assistive intent, perceived user benefits, perceived usefulness, and perceived ease of use, I added the scales for the latter two from Davis (1989). This generated an initial item pool for the first card sorting round. For this item pool, a seven-point Likert scale was used (1 = strongly disagree to 7 = strongly agree). See Table 88.

Author(s)	Construct in this Thesis	Original Construct	Measurement Item	Scale
Bearden et al. (2001)	Persuasion knowledge (dispositional)	Persuasion knowledge	I know when an offer is "too good to be true."	1 = extremely uncharacteristic to
			I can tell when an offer has strings attached.	5 = extremely characteristic
			I have no trouble understanding the bargaining tactics used by salespersons.	
			I know when a marketer is pressuring me to buy.	
			I can see through sales gimmicks used to get consumers to buy.	
			I can separate fact from fantasy in advertising.	
Boush et al. (1994)	Behavioral response	Skepticism toward television advertising	TV commercials tell the truth.	1 = strongly disagree to 5 = strongly agree
	Behavioral response - negative attitudes towards persuasion design	- Disbelief in ad claims	You can believe what the people in commercials say or do.	
			The products advertised on TV are always the best products to buy.	

Author(s)	Construct in this Thesis	Original Construct	Measurement Item	Scale
			You can depend on getting the truth from most TV advertising.	
			If a TV commercial was not true, it could not be on television.	
	Behavioral response - negative attitudes towards an agent	- Mistrust of advertiser motives	Advertisers care more about getting you to buy things than what is good for you.	1 = strongly disagree to 5 = strongly agree
			I often notice tricks that TV advertisers play to get me to buy something.	
			TV commercials try to make people buy things they don't really need.	
			TV commercials are different from TV programs in the way they try to influence you.	
			TV commercials tell only the good things about a product, they don't tell you the bad things.	
			TV commercials are all about the same when it comes to telling the truth.	
Campbell (1995)			Bad - good	

Author(s)	Construct in this Thesis	Original Construct	Measurement Item	Scale
	Behavioral response - attitudes towards an agent	Attitudes toward the brand	Pleasant - unpleasant	Seven-point semantic differential scales
			Low quality - high quality	
			Likable - dislikable	
	Behavioral response - intention to approach a target	Intentions to purchase the advertised brand	How likely would you be to choose the brand?	1 = extremely unlikely to 7 = extremely likely
	Behavioral response - attitudes towards persuasion design	Attitudes toward the ad	Pleasant - unpleasant	Seven-point semantic differential scales
			Bad - good	
			Awful - nice	
	Perceived appropriateness	Inferences of manipulative intent	The way this ad tries to persuade people seems acceptable to me.	1 = completely agree to 7 = completely disagree
			The advertiser tried to manipulate the audience in ways that I don't like.	
			I was annoyed by this ad because the advertiser seemed to be trying to inappropriately manage or control the consumer audience.	

Author(s)	Construct in this Thesis	Original Construct	Measurement Item	Scale
			I didn't mind this ad; the advertiser tried to be persuasive without being excessively manipulative.	
			This ad was fair in what was said and shown.	
			I think that this advertisement is unfair/fair.	
	Perceived user benefits	Personal benefit	I got more out of the overall experience of watching this ad than I get from most ads.	1 = completely agree to 7 = completely disagree
			I got a satisfying mixture of enjoyment and information from this ad.	
			I enjoyed the execution of this ad.	
			I did not really get any entertainment or enjoyment from this ad. (R)	
			I feel I benefited from watching this ad.	
			I didn't get any new ideas or information from this ad.	
	Perceived user costs	Personal investments	Overall, I got more involved with this ad than with most prime-time TV ads.	1 = completely agree to 7 =
			I didn't pay much attention to this ad. (R)	

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Author(s)	Construct in this Thesis	Original Construct	Measurement Item	Scale
			I was intrigued by this ad.	completely
			My sympathies were not engaged by this ad.	disagree
			My curiosity and interest were evoked by this ad.	
			I responded emotionally to parts of this ad.	
	Perceived agent benefits	Advertiser's benefits	Compared to most ads, the advertiser has high expectations about the impact this ad will have on consumers.	1 = completely agree to 7 = completely disagree
			The advertiser's goal for this ad is very ambitious.	
			The advertiser is trying to get a lot from the audience with this ad.	
			The advertiser has high expectations about what the ad will get people to believe.	
			Overall, I don't feel as if the advertiser is asking that much of me. (R)	
	Perceived agent costs	Advertiser's investments	The advertiser seems to have put more effort into this ad than is usual for prime-time TV ads.	1 = completely agree to 7 =

Author(s)	Construct in this Thesis	Original Construct	Measurement Item	Scale
			The advertiser seems to have put a lot of time into this ad.	completely disagree
			The advertiser deserves credit for the creative effort that went into this ad.	
			This ad was expensive to make.	
			This ad shows a lot of thought and care.	
Campbell and Kirmani (2000)	Perceived persuasive intent	Inferences of ulterior motives (perceived sales motive)	What did they think the salesclerk's primary goal would be in the situation? (to make a sale/earn a commission, to satisfy the customer, to build a good relationship with the customer)	Open-ended
			Circle the number that best indicated the extent to which different motives represented the salesclerk's goal.	1 = completely disagree to 7 = completely agree
			Pat said the jacket looked great because s/he was trying to make a sale.	
			Write an essay about Pat. (the proportion of suspicion thoughts including thoughts	Open-ended

Author(s)	Construct in this Thesis	Original Construct	Measurement Item	Scale
			about Pat's motives, ulterior intent, use of flattery to total thoughts	
			While I read the story, I thought it was pretty obvious that Pat was trying to persuade the customer.	1 = completely disagree to 7 = completely agree
			Companies use charitable giving as a way to influence or persuade their target customers	1 = completely disagree to 7 = completely agree
			Companies give to charities because they think charitable giving results in increased sales	
			Pat had an ulterior motive for saying the jacket looked good.	
	Perceived persuasive intent	Perceived salesperson sincerity	Sincere - insincere	Seven-point semantic differential scales
			Honest - dishonest	
			Not manipulative - manipulative	
			Not pushy - pushy	
			Why is the advertiser using this tactic?	Open-ended

Author(s)	Construct in this Thesis	Original Construct	Measurement Item	Scale
			Please write down the thoughts that went through your head	
Jain and Posavac (2004)	Perceived assistive - persuasive intent	Advertiser attributions	Dishonest - honest	Nine-point semantic differential scales
			Close-minded - open-minded	
			Manipulative - nonmanipulative	
			Biased - unbiased	
			Insincere - sincere	
			Opportunistic – non-opportunistic	
			Subjective - objective	
	Behavioral response - attitudes towards a persuasion agent	Attitudes toward the advertised brand	Claim believability:	Nine-point semantic differential scales
			Not at all believable - highly believable	
			Not at all true - absolutely true	
	Behavioral response - intention to approach a target	Intention to purchase	Not at all likely - very likely	
	Perceived assistive - persuasive intent	Cognitive responses	List "all thoughts that came to [their] mind ... related to the brand(s) featured in the advertisement, to the claim(s) made in the advertisement, [to] the evidence provided,	Open-ended

Author(s)	Construct in this Thesis	Original Construct	Measurement Item	Scale
			to the general looks of the advertisement, to the message per se, or [to] any other related or unrelated matter."	
Kirmani and Zhu (2007)	Perceived appropriateness	Diagnosticity of manipulative intent	The extent to which they believed that the ad claim tried to persuade by inappropriate means.	1 = not at all to 7 = extremely
			The extent to which they believed that the ad claim tried to persuade by unfair means.	
			The extent to which they believed that the ad claim tried to persuade by manipulative means.	
	Behavioral response - negative attitudes	Desirability of manipulative intent	It really offends me when a company attempts to persuade by inappropriate means.	1 = strongly disagree to 7 = strongly agree
			It really offends me when a company attempts to persuade by unfair means.	
			It really offends me when a company attempts to persuade by manipulative means.	

Author(s)	Construct in this Thesis	Original Construct	Measurement Item	Scale
Moyer-Gusé et al. (2012)	Perceived persuasive intent	Perceived persuasive intent	The episode was created to influence viewers' behavior.	1 = strongly disagree to 7 = strongly agree
Obermiller and Spangenberg (1998)	Persuasion knowledge (dispositional)	Skepticism toward advertising (SKEP)	We can depend on getting the truth in most advertising.	1 = strongly agree to 5 = strongly disagree
			Advertising's aim is to inform the consumer.	
			I believe advertising is informative.	
			Advertising is generally truthful.	
			Advertising is a reliable source of information about the quality and performance of products.	
			Advertising is a truth well told.	
			In general, advertising presents a true picture of the product being advertised.	
			I feel I've been accurately informed after viewing most advertisements.	
			Most advertising provides consumers with essential information.	

Author(s)	Construct in this Thesis	Original Construct	Measurement Item	Scale
Wei et al. (2008)	Perceived appropriateness	Perceived appropriateness	It seems acceptable to me if the brand had paid to be mentioned.	1 = strongly disagree to 9 = strongly agree
			It seems fair to me if the brand had paid to be mentioned.	
Williams et al. (2004)	Perceived persuasive intent	Persuasion knowledge activation	The purpose of the question on the previous page was to change my behavior.	1 = strongly disagree to 7 = strongly agree
			While I read the question, I thought it was pretty obvious that the author of the question was attempting to persuade me.	
			The degree to which you felt the sponsor was	Seven-point semantic differential scales
			Not at all self-interested - very self-interested	
			Did not have a direct profit motive - had a very direct profit motive	
			Not at all objective - very objective (R)	
			Response latency for 10 words with 3 persuasion words (4th, 6th, 9th word)	

Author(s)	Construct in this Thesis	Original Construct	Measurement Item	Scale
			including suspicious, manipulative, and coerce, and 7 control words	

Note: R – reversed item

Table 87. Examples of measurement scales in the existing literature

Construct	Definition	Variable Name	Expected Measurement Items	Source	Original Construct
Perceived assistive intent	A user's perception that a website tries to help her to fulfill her own goal	Assist1	I feel the website was trying to help me.	Newly developed	
		Assist2	I perceive the website was assisting me.	Newly developed	
		Assist3_R	I do not feel the website attempted to help me. (R)	Newly developed	
Perceived user benefits	A user's perception that she benefits from interacting with a website (e.g., information)	UBenefit1	I feel I benefited from interacting with the website.	Campbell (1995)	Personal benefits
		UBenefit2	I perceive I got benefits from interacting with the website.	Campbell (1995)	Personal benefits
		UBenefit3_R	I did not get any information from interacting with the website. (R)	Campbell (1995)	Personal benefits
Perceived persuasive intent	A user's perception that a website tries to persuade her to fulfill its goal	Persuasive1	The website tried to make me act in a certain way.	Al-Natour et al. (2006)	Directives
		Persuasive2	The website tried to direct my decision.	Al-Natour et al. (2006)	Directives
		Persuasive3	The website did not try to influence me to perform a certain action.	Newly developed	

Construct	Definition	Variable Name	Expected Measurement Items	Source	Original Construct
Perceived agent (website) benefits	A user's perception that a website benefits from her (e.g., her attention to a particular target, her awareness of a specific thing, or sales)	WBenefit1	The website's goal is very ambitious.	Campbell (1995)	Agent benefits
		WBenefit2	The website is trying to get a lot from me.	Campbell (1995)	Agent benefits
		WBenefit3_R	Overall, I don't feel as if the advertiser is asking that much of me. (R)	Campbell (1995)	Agent benefits
Perceived user costs	A user's perception of her costs (e.g., attention, processing effort, or involvement) used in interacting with a website feature	UCost1	I got involved with the website.	Campbell (1995)	Personal investments
		UCost2	I was involved in interacting with the website.	Campbell (1995)	Personal investments
		UCost3_R	I did not pay much attention to the website. (R)	Campbell (1995)	Personal investments
Perceived agent (website) costs	A user's perception of the website's costs (e.g., money, time, or effort) used in delivering a website feature	WCost1	The website seems to have put more effort into its design features.	Campbell (1995)	Agent investments
		WCost2	The website seems to have put a lot of time into its design features.	Campbell (1995)	Agent investments

Construct	Definition	Variable Name	Expected Measurement Items	Source	Original Construct
		WCost3_R	The website did not show a lot of thought and care in its design features. (R)	Campbell (1995)	Agent investments
Perceived usefulness	The degree to which a user believes that using the website would enhance her task.	Useful1	Using the website would enable me to accomplish my shopping task more quickly.	Davis et al. (1989)	Perceived usefulness
		Useful2	Using the website would make it easier to do my shopping task.	Davis et al. (1989)	Perceived usefulness
		Useful3_R	I would find the website not useful in my shopping task. (R)	Davis et al. (1989)	Perceived usefulness
Perceived ease of use	The degree to which a user believes that using the website would be free of effort.	Ease1	I would find it easy to get the website to do what I want it to do.	Davis et al. (1989)	Perceived ease of use
		Ease2	I would find the website to be flexible to interact with.	Davis et al. (1989)	Perceived ease of use
		Ease3_R	I would find the website not easy to use. (R)	Davis et al. (1989)	Perceived ease of use

Note: R – reversed item

Table 88. Item pool for first sorting round

Stage 2: Scale Development

Sorting Procedures. The item pool was randomly presented to the judges. Each judge sorted all items into groups and/or labeled the groups of items independently from other judges. In all sorting rounds, I used a different set of judges. They were from different backgrounds, including students, professors, and office workers. In all sorting rounds, following Moore and Benbasat (1991), I focused on the item placement ratio, which is "an indicator of how many items were placed in the intended, or target, category by the judges" (p. 212). A high ratio indicates that the items underlying an intended construct are differentiated enough from the items developed for other constructs. On the contrary, a low ratio suggests that the items underlying a targeted construct are not sufficiently differentiated from the items created for other constructs.

First Sorting Round. The five students were asked to sort all items into groups and label the groups based on their understanding. They were allowed to put items into the "N/A" group if they did not see the items fit with the groups. The item placement scores, ratio, and category labels, are reported in Table 89. Results showed that 41.67% of items were placed in the intended categories. For perceived persuasive intent, perceived user costs, and perceived website costs, 66.67% were within the targeted construct. However, judges did not perceive the difference between perceived assistive intent and perceived user benefits and the difference between perceived persuasive intent and perceived agent benefits. Also, they categorized perceived usefulness and perceived ease of use into perceived user benefits. These indicated that the items were ambiguous and required adjustments.

Targeted Category	Actual Categories									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Total**	**Target**
Perceived assistive intent	4	4	1	0	1	0	2	0	12	0.00%
Perceived user benefits	**7**	2	1	0	0	0	2	0	12	58.33%
Perceived persuasive intent	1	**8**	2	0	0	0	1	0	12	66.67%
Perceived website benefits	1	3	1	2	1	0	1	3	12	0.00%
Perceived user costs	3	0	**8**	1	0	0	0	0	12	66.67%
Perceived website costs	1	0	0	**8**	1	0	2	0	12	66.67%
Perceived usefulness	4	0	0	0	**5**	1	2	0	12	41.67%
Perceived ease of use	4	0	0	0	1	**4**	2	1	12	33.33%
Total item placements	25	17	13	11	9	5	12	4	96	
Hits									40	
Overall hit ratio									41.67%	

Note: Judges' actual category labels – Category 1 = perceived outcome (usefulness/effectiveness)/reasons to continue using the website/website purpose, Category 2 = reasons for being skeptical of the website/website purpose/interaction process/perceived efficiency, Category 3 = reasons to continue using the website/user experience/interaction process/perceived usability, Category 4 = comments to the website/perceived value of the website/reasons I would be reluctant to use the website again, Category 5 = expected outcome (usefulness/effectiveness)/reasons to continue using the website/website convenience, Category 6 = website convenience, Category 7 = reasons I would be reluctant to use the website again/ website functionality/negative feedback when interacting with website, Category 8 = N/A

Table 89. Item placement scores of the first sorting round

Second Sorting Round. Due to the low overall hit ratio of the first sorting round. I modified the scale items for perceived agent benefits and perceived user costs.

For perceived agent benefits, it appears that the items did not directly capture the benefits of the e-commerce website. In this particular context, there are two dimensions of agent benefits: 1) attention/awareness of a targeted product and 2) sales of a targeted product. As a result, I borrowed one scale item from Williams et al. (2004) and developed five new items. Also, perceived user costs can be categorized into two sub-categories—attention/involvement and effort—in the specific context. See Table 90 for the modified scale items.

Item Name	Item	Scale/Source
Perceived agent benefits – attention/awareness		
Wbenefit_A1	The website attempts to draw my attention to a certain product.	Newly developed
Wbenefit_A2	The website is trying to get my attention to a specific product.	Newly developed
Wbenefit_A3_R	Overall, I do not feel that the website's goal is to make me aware of a particular product. (R)	Newly developed
Perceived agent benefits – sales		
WBenefit_S1	The website has a direct profit motive.	Williams et al. (2004)
WBenefit_S2	The website tries to make a sale of a certain product.	Newly developed
WBenefit_S3_R	I do not think the website's goal is to sell a specific product. (R)	Newly developed
Perceived user costs – attention/involvement		
Ucost_A1	I got involved with the website.	Campbell (1995)
Ucost_A2	I was involved in interacting with the website.	Campbell (1995)

Item Name	Item	Scale/Source
Ucost_A3_R	I did not pay much attention to the website. (R)	Campbell (1995)
Perceived user costs – effort		
Ucost_E1	I put a lot of effort into interacting with the website.	Tsekouras et al. (Working Paper)
Ucost_E2	I worked hard interacting with the website.	Tsekouras et al. (Working Paper)
Ucost_E3_R	I did not exert a lot of effort into interacting with the website. (R)	Tsekouras et al. (Working Paper)

Note: R – reversed item

Table 90. Additional items for the second sorting round

The four judges (three IS professors and a researcher) were asked to sort all items into groups and label the groups based on their thoughts. They were allowed to put items into the "N/A" group if they did not see the items fit with any groups. Table 91 presents the item placement scores, ratio, and category labels. Results indicated that that 60% of items were placed in the intended categories. For perceived assistive intent, persuasive intent, and perceived website costs, 100% were within the intended construct. 83.33% of perceived ease of use items were placed in the targeted construct. For both dimensions of perceived user costs, 75% of the items were grouped into the targeted construct. Nonetheless, judges did not perceive the difference between perceived assistive intent and perceived user benefits and the difference among perceived persuasive intent and perceived agent benefits in terms of attention/awareness and sales. Also, they categorized perceived usefulness into perceived user benefits. These indicated that the scales for perceived assistive intent, perceived persuasive intent, and perceived website costs successfully captured the intended constructs. The scales for both dimensions of perceived user costs were acceptable. Also, judges differentiated perceived ease of use from other constructs in my thesis. However, the items for perceived user benefits and perceived agent benefits were ambiguous.

Targeted Category	Actual Categories									Total	Target
	1	2	3	4	5	6	7	8	9		
Perceived assistive intent	**12**	0	0	0	0	0	0	0	0	12	100.00%
Perceived user benefits	6	**5**	0	0	1	0	0	0	0	12	41.67%
Perceived persuasive intent	0	0	**12**	0	0	0	0	0	0	12	100.00%
Perceived website benefits - attention/awareness	0	0	12	0	0	0	0	0	0	12	0.00%
Perceived website benefits - sales	0	0	12	0	0	0	0	0	0	12	0.00%
Perceived user costs - attention/involvement	0	0	0	**9**	0	2	0	1	0	12	75.00%
Perceived user costs - effort	0	0	0	0	**9**	0	0	3	0	12	75.00%
Perceived website costs	0	0	0	0	0	**12**	0	0	0	12	100.00%

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Targeted Category	Actual Categories										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Total**	**Target**
Perceived usefulness	4	2	0	0	0	0	**3**	3	0	12	25.00%
Perceived ease of use	0	0	0	0	0	2	0	**10**	0	12	83.33%
Total item placements	22	7	36	9	10	16	3	17	0	120	
Hits										72	
Overall hit ratio										60.00%	

Note: Judges' actual category labels – Category 1 = perceived helpfulness/perceived assistance of the website/usefulness, Category 2 = attained benefits/perceived benefit in using the website/usefulness, Category 3 = distinctiveness/drawing attention/hidden motive, Category 4 = involvement/perceived involvement/interactivity and design, Category 5 = interaction effort/perceived effort in interacting with the website/user effort, Category 6 = design/design features/perceived quality of design features of the website, Category 7 = perceived usefulness/usefulness/effort and ease, Category 8 = ease of use/perceived ease of use/effort and ease, Category 9 = N/A

Table 91. Item placement scores of the second sorting round

Third Sorting Round. The four judges (one student, two professors in non-IS field, and one office worker) were asked to sort all items into pre-defined categories. These categories were provided with their definitions. See Table 98 for detail.

Pre-Defined Category	Definitions
Perceived assistive intent	A user's perception that a website tries to help her to fulfill her own goal
Perceived user benefits	A user's perception that she benefits from interacting with a website (e.g., information)
Perceived persuasive intent	A user's perception that a website tries to persuade her to fulfill its goal
Perceived website benefits	A user's perception that a website benefits from her (e.g., her attention to a particular target, her awareness of a specific thing, or sales)
Perceived user costs	A user's perception of her costs (e.g., attention, processing effort, or involvement) used in interacting with a website feature
Perceived website costs	A user's perception of the website's costs (e.g., money, time, or effort) used in delivering a website feature
Perceived usefulness	The degree to which a user believes that using the website enhances her task.
Perceived ease of use	The degree to which a user believes that using the website is free of effort.
N/A	Place items which you felt fit none of the categories provided

Table 92. Pre-defined categories and definitions in the third sorting round

The pre-defined categories would be helpful for judges. Judges were allowed to place items into the "N/A" group if they did not feel the items belonged to the pre-defined categories. Table 93 reports the item placement score and ratio. Results suggested that that 61.67% of items were placed in the targeted categories. For perceived assistive intent, perceived user benefits, perceived

persuasive intent, and perceived ease of user, 75% of scale items were placed within the targeted construct. 91.67% of perceived website costs item were within the intended construct. 66.67% of perceived usefulness items were within the target. However, some of website benefits items were placed within the perceived persuasive intent construct. Inconsistent with the previous sorting rounds, only 33.33% of perceived user costs items were within the intended construct. Although the overall hit ratio was not high, this sorting revealed that judges differentiated between perceived assistive intent and perceived user benefits, as well as between perceived persuasive intent and perceived agent benefits. Also, they felt that perceived usefulness and perceived ease of use differed from the constructs studied in this thesis.

Targeted Categories	Actual Categories									Total	Target
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**		
Perceived assistive intent	**9**	1	1	0	0	0	0	0	1	12	75.00%
Perceived user benefits	0	**9**	0	0	1	0	2	0	0	12	75.00%
Perceived persuasive intent	1	0	**9**	1	0	0	1	0	0	12	75.00%
Perceived website benefits	1	0	7	**11**	0	0	1	0	4	24	45.83%
Perceived user costs	1	2	0	1	**8**	0	1	5	6	24	33.33%
Perceived website costs	0	0	0	0	0	**11**	1	0	0	12	91.67%
Perceived usefulness	0	1	0	0	1	2	**8**	0	0	12	66.67%
Perceived ease of use	2	0	0	0	1	0	0	**9**	0	12	75.00%
Total item placements	14	13	17	13	11	13	14	14	11	120	
Hits										74	
Overall hit ratio										61.67%	

Note: Pre-defined category – Category 1 = perceived assistive intent, Category 2 = perceived user benefits, Category 3 = Perceived persuasive intent, Category 4 = perceived website benefits, Category 5 = perceived user costs, Category 6 = perceived website costs, Category 7 = perceived usefulness, Category 8 = perceived ease of use, Category 9 = N/A

Table 93. Item placement scores of the third sorting round

Expected Construct	Definition	Variable Name	Measurement Items	Source	Original Construct
Perceived assistive intent	A user's perception that a website tries to help her to fulfill her own goal	Assist1	I feel the website was trying to help me.	Newly developed	
		Assist2	I perceived the website was trying to assist me.	Newly developed	
		Assist3_R	I did not feel the website attempted to help me. (R)	Newly developed	
Perceived user benefits	A user's perception that she benefits from interacting with a website (e.g., information)	UBenefit1	I felt I benefited from interacting with the website.	Campbell (1995)	Personal benefits
		UBenefit2	I perceived I got benefits from interacting with the website.	Campbell (1995)	Personal benefits
		UBenefit3_R	I did not get any information from interacting with the website. (R)	Campbell (1995)	Personal benefits
Perceived persuasive intent	A user's perception that a website tries to persuade her to fulfill its goal	Persuasive1	The website tried to make me act in a certain way.	Al-Natour et al. (2006)	Directives
		Persuasive2	The website tried to direct my decision.	Al-Natour et al. (2006)	Directives

Expected Construct	Definition	Variable Name	Measurement Items	Source	Original Construct
		Persuasive3_R	The website did not try to influence me to perform a certain action. (R)	Newly developed	
Perceived agent benefits	A user's perception that an agent benefits from her (e.g., her attention to a particular target, her awareness of a specific thing, or sales)				
-Attention/ awareness		Wbenefit_A1	The website attempted to draw my attention to a certain product.	Newly developed	
		Wbenefit_A2	The website was trying to get my attention to a specific product.	Newly developed	
		Wbenefit_A3_R	Overall, I did not feel that the website's goal was to make me aware of a particular product. (R)	Newly developed	
- Sales		WBenefit_S1	The website had a direct profit motive.	Williams et al. (2004)	Persuasion knowledge activation
		WBenefit_S2	The website tried to make a sale of a certain product.	Newly developed	
		WBenefit_S3_R	I did not think the website's goal was to sell a specific product. (R)	Newly developed	

Expected Construct	Definition	Variable Name	Measurement Items	Source	Original Construct
Perceived user costs	A user's perception of her costs (e.g., attention, processing effort, or involvement) used in interacting with a website feature				
- Attention/ involvement		Ucost_A1	I got involved with the website.	Campbell (1995)	Personal investments
		Ucost_A2	I was involved in interacting with the website.	Campbell (1995)	Personal investments
		Ucost_A3_R	I did not pay much attention to the website. (R)	Campbell (1995)	Personal investments
- Effort		Ucost_E1	I put a lot of effort into interacting with the website.	Tsekouras et al. (Working Paper)	Perceived user effort
		Ucost_E2	I worked hard interacting with the website.	Tsekouras et al. (Working Paper)	Perceived user effort
		Ucost_E3_R	I did not exert a lot of effort into interacting with the website. (R)	Tsekouras et al.	Perceived user effort

Expected Construct	Definition	Variable Name	Measurement Items	Source	Original Construct
				(Working Paper)	
Perceived agent (website) costs	A user's perception of the agent's costs (e.g., money, time, or effort) used in delivering a website feature	WCost1	The website seemed to have put more effort into its design features.	Campbell (1995)	Website's investments
		WCost2	The website seemed to have put a lot of time into its design features.	Campbell (1995)	Website's investments
		WCost3_R	The website did not show a lot of thought and care in its design features. (R)	Campbell (1995)	Website's investments

Note: R – reversed item

Table 94. Final measurement for persuasion awareness

Stage 3: Instrument Testing

Initial Pretest. In this stage, an initial pretest of the overall measurement was conducted. All items were randomly ordered. The first aim of this test was to ensure the construct validity and reliability of the measurement. The second aim was to eliminate as many scale items as possible for the main study of empirical study 1 and 2. As this main study also included extensive scale items for manipulation checks, persuasion awareness consequences, and other control variables, shorter persuasion awareness items were less likely to create participants' fatigue and more likely to draw their involvement. As this test served as a pretest for empirical study 1 and 2's main study, an experimental website featuring different suggestive features was used. A 4 (suggestive content: control, "Best-selling item," "Recommended for you," and "Buy this item") between-subjects was implemented. The 204 participants from Prolific were recruited. They were asked to complete the pre-questionnaire survey that captured their demographics and initial product preferences. Then, they were asked to enter an experimental website, called Home Appliance Group (homeappliancegroup.com), to evaluate its design and choose one digital bathroom scales they would seriously consider purchasing. The experimental website and pre-questionnaire survey were the same for all suggestive content conditions. However, for the treatment conditions, this pretest offered a product personalization. That is, the product item which had the highest fit scores based on the top three most important product attributes participants valued was attached with the suggestive feature. Also, a tutorial was added to instruct participants to use a website properly. It was used in the main experiment of empirical study 1 and 2 as well. Once they added a product to a cart, they were redirected to the post-questionnaire survey that included the 24 persuasion awareness scale items. Upon the post-questionnaire survey completion, they received £2. Those

who did not follow the instructions carefully and failed attention check questions were excluded from the following analysis, resulting in 171 usable participants.

Results on instrument testing. All scale reliabilities were greater than 0.70, except perceived agent (website) benefits in terms of sales (0.65) and perceived user costs in terms of attention and involvement (0.69). According to Nunnally (1967), the reliability of 0.50 to 0,60 would suffice in the early stages of research. As this is an initial pretest of the measurement, the reliability above 0.60 would be acceptable. See Table 95 for the scale reliability of scales, in the beginning, initial pretest.

Scale Name	Beginning Initial Pretest			Ending Initial Pretest		
	Number of Items	Item	Cronbach's Alpha	Number of Items	Item	Cronbach's Alpha
Perceived assistive intent	3	Assist1	0.78	3	Assist1	0.78
		Assist2			Assist2	
		Assist3_R			Assist3_R	
Perceived user benefits	3	UBenefit1	0.71	3	UBenefit1	0.71
		UBenefit2			UBenefit2	
		UBenefit3_R			UBenefit3_R	
Perceived persuasive intent	3	Persuasive 1	0.80	3	Persuasive 1	0.80
		Persuasive 2			Persuasive 2	
		Persuasive 3_R			Persuasive 3_R	
Perceived agent	3	Wbenefit_ A1	0.80	N/A	Removed	N/A

Scale Name	Beginning Initial Pretest			Ending Initial Pretest		
	Number of Items	Item	Cronbach's Alpha	Number of Items	Item	Cronbach's Alpha
(website) benefits – awareness		Wbenefit_A2			Removed	
		WBenefit_A3_R			Removed	
Perceived agent (website) benefits – sales	3	Wbenefit_S1	0.65	N/A	Removed	N/A
		Wbenefit_S2			Removed	
		WBenefit_S3_R			Removed	
Perceived user costs – attention/involvement	3	Ucost_A1	0.69	3	Ucost_E1	0.86
		Ucost_A2			Ucost_E2	
		Ucost_A3_R			Ucost_E3_R	
Perceived user costs – effort	3	Ucost_E1	0.86	3	Ucost_E1	0.86
		Ucost_E2			Ucost_E2	
		Ucost_E3_R			Ucost_E3_R	
Perceived website costs	3	WCost1	0.83	3	WCost1	0.83
		WCost2			WCost2	
		WCost3_R			WCost3_R	
Total	21			18		

Table 95. Reliability coefficients in the measurement pretest

Principal Component Analysis (PCA) was performed with VARIMAX rotation. Results suggested that a five-factor solution was the most likely since the five factors had eigenvalues greater than 1. Also, the scree plot indicated a break after the fifth factor. These five factors accounted for 67.86% of the variance in the data. The "perceived user costs in terms of effort" and "perceived agent costs) factors emerged relatively cleanly. In contrast, the "perceived assistive intent" and "perceived user benefits" (except UBenefit3_R) items loaded to one factor, the "perceived assistance beliefs" factor. This suggests their relationship between the two. Similarly, the "perceived persuasive intent," "perceived agent benefits in terms of attention/awareness," and "perceived agent benefits in terms of sales" loaded to one factor, the "perceived persuasion beliefs" factor, indicating their relationships. Although "perceived agent benefits in terms of attention/awareness strongly loaded to the perceived persuasion factor, I removed them from the scale. There are two reasons. First, attention or involvement users spend on PDFs would be less salient in the online settings than in the advertising context, as studied in Campbell (1995). Thus, users' attention or involvement does not truly reflect costs, as captured by the effort aspect. Also, other variables (e.g., control) are captured in the main experiments, making the questionnaire too long and participants exhausted. Thus, reducing the scale items for perceived agent benefits in terms of attention/awareness will be helpful. Also, the items for the "perceived user costs in terms of attention/involvement" tapped onto both "perceived assistance" and another factor. Thus, these items were dropped from the scales. These left an 18-item instrument for persuasion awareness and relevant perceptions. See Table 96 for the rotated factor matrix.

Item	Factor				
	1	**2**	**3**	**4**	**5**
Assist1	0.01	**0.76**	-0.07	0.17	0.05
Assist2	0.13	**0.77**	-0.01	0.12	0.09
Assist3_R	0.18	**0.62**	0.01	0.10	0.41
Ubenefit1	-0.13	**0.70**	0.04	0.34	0.06
Ubenefit2	-0.10	**0.73**	0.06	0.26	0.04
Ubenefit3_R	-0.12	0.36	-0.02	0.13	**0.69**
Persuasive1	**0.74**	0.05	-0.01	-0.02	-0.23
Persuasive2	**0.80**	0.15	0.06	-0.07	-0.14
Persuasive3_R	**0.77**	-0.05	0.07	0.04	0.21
WBenefit_A1	**0.80**	0.13	0.08	-0.11	-0.13
WBenefit_A2	**0.88**	0.07	0.06	-0.04	-0.15
WBenefit_A3_R	**0.61**	-0.02	0.11	0.11	0.09
WBenefit_S1	**0.56**	-0.19	-0.13	0.06	0.19
WBenefit_S2	**0.85**	0.10	0.07	-0.06	-0.03
WBenefit_S3_R	**0.64**	-0.14	0.04	0.13	0.24
UCost_A1	0.05	0.64	0.38	-0.01	0.16
UCost_A1	0.03	0.54	0.49	-0.07	0.11
UCost_A1	0.07	0.22	0.39	0.00	**0.63**
UCost_E1	0.09	0.06	**0.88**	0.16	0.01
UCost_E2	0.13	0.03	**0.86**	0.06	0.00
UCost_E3_R	0.01	0.00	**0.83**	0.05	0.13
WCost1	0.05	0.19	0.13	**0.88**	-0.03
WCost2	0.08	0.38	0.06	**0.80**	-0.04
WCost3_R	-0.07	0.22	0.08	**0.71**	0.35

Note: Bold = strong loading, red = loading inconstant with my expectation

Table 96. Rotated factor matrix in the measurement pretest (exploratory)

Next, I conducted PCA with VARIMAX rotation, specifying a four-factor solution. As expected, the four factors emerged, as expected. These factors accounted for 64.04% of the variances in the data. All items loaded to their respective constructs, with loading greater than 0.70, except UBenefit3_R (0.51), WBenefit_S2 (0.62), and WBenefit_S3_R (0.64). The low loading of the two reversed items (UBenefit3_R and WBenefit_S3_R) was not surprising, as participants might not be aware of the word "not" in the items when responding to a large set of questions. Table 97 details the rotated factor matrix. Despite having low loading, the three items were retained for the main experiment. I expected that collecting more data would be helpful to evaluate the measurement model.

Item	Factor			
	1	**2**	**3**	**4**
Assist1	-0.01	**0.79**	-0.03	0.12
Assist2	0.13	**0.80**	0.01	0.09
Assist3_R	0.15	**0.76**	0.09	0.05
Ubenefit1	-0.11	**0.70**	0.04	0.33
Ubenefit2	-0.08	**0.73**	0.07	0.24
Ubenefit3_R	-0.13	**0.52**	0.04	0.16
Persuasive1	**0.80**	-0.04	-0.04	-0.02
Persuasive2	**0.82**	0.09	0.06	-0.06
Persuasive3_R	**0.79**	0.06	0.16	-0.03
WBenefit_S1	**0.62**	-0.12	-0.10	0.05
WBenefit_S2	**0.83**	0.08	0.08	-0.06
WBenefit_S3_R	**0.64**	-0.07	0.08	0.12
UCost_E1	0.06	0.05	**0.88**	0.16
UCost_E2	0.11	0.04	**0.88**	0.05
UCost_E3_R	0.00	0.06	**0.87**	0.02

Item	Factor			
	1	**2**	**3**	**4**
WCost1	0.06	0.18	0.12	**0.88**
WCost2	0.07	0.36	0.04	**0.80**
WCost3_R	-0.06	0.27	0.07	**0.75**

Note: Bold = strong loading

Table 97. Rotated factor matrix in the measurement pretest (confirmatory)

Conclusion. According to the third sorting round, judges differentiated the items for perceived usefulness and perceived ease of use from those for persuasion awareness and relevant constructs in this thesis. Thus, perceived assistive intent and perceived user benefits are not the same concept of TAM. Also, the third sorting round indicates four different categories for perceived persuasive intent, perceived agent benefits, perceived assistive intent, and perceived user benefits. However, the results of PCA suggest that perceived persuasive intent and perceived agent benefits belonged to one factor, and perceived assistive intent and perceived user benefits capture another factor. This might be due to the correlation between the two dimensions. Accordingly, I argue that there might be latent commonality underlying the dimensions. In particular, I propose that 1) the *perceived persuasion beliefs* higher-order construct underlies perceived persuasive intent and perceived agent (website) benefits, and 2) the *perceived assistance beliefs* high-order construct underlies perceived assistive intent and perceived user benefits. For perceived agent benefits, I determine to retain only sales intent, since the dimension of sales intent reflects a stronger form of agent benefits than the attention/awareness dimension. According to PCA results, the scale of perceived user costs in terms of effort and perceived agent costs are retained. These measures are used in the pretests and main experiments of empirical study 1 and 2.

E.3   Suggestive Content Pretest 1

Objective. This pretest aimed to identify suggestive content PDFs, which stimulate different levels of perceived assistive intent and perceived persuasive intent. The expected levels are depicted in Table 98. In this pretest, a claim element and a data element were a focus.

Perceived Assistive Intent	Perceived Persuasive Intent	
	Low	**High**
Low	1) Low assistive – low persuasive	2) Low assistive – high persuasive
High	3) High assistive – low persuasive	4) High assistive – high persuasive

Table 98. Expected perceived assistive intent and perceived persuasive intent in the suggestive content pretest 1

Method. Based on my literature review on Toulmin's argument elements and related studies (e.g., Fox and Modgil 2006) and real-world examples, I defined four possible types of claim and their respective manipulation: 1) an action – "buy this item," 2) a recommendation – "we recommend this," 3) a conclusion – "this is great," and 4) a standpoint – "we like this." Also, I identified four applicable manipulations on data: 1) "best-selling item," 2) "3 bought today," 3) "low in stock," and 4) "because you value price." These manipulations were adjusted in terms of the word count to three, except "because you value price." This aims at controlling for quantity, as individuals can use word counts as a simple cue for acceptance (e.g., Petty and Cacioppo 1984). That is, the longer is better. I summarize the types of suggestive content PDF, manipulations, and real-world examples in Table 99. Therefore, an 8 (*suggestive content*: buy this item, we recommend this, this is great, we like this, best-selling item, 3 bought today, low in stock, and because you value price) within-subjects design was implemented. Each suggestive element was attached to the first product item appeared in a static screenshot of an experimental website, called Home Appliance Group

(homeappliancegroup.com), which sells digital bathroom scales. All eight suggestive content were randomly presented. As this pretest's objective is to assess how participants perceived each suggestive content, I circled the content to direct participants' attention to it. An example screenshot for the "we recommend this" is presented in Figure 35. Participants were asked to evaluate the suggestive content elements in terms of their perceptions pertaining to suggestive – quasi-suggestive design, content element, assistive intent, persuasive intent, and appropriateness. Once they completed the survey-questionnaire, they received a participation reward of £1.5.

Suggestive Content PDF	Manipulation	Real-World Example
Claim - action	Buy this item	Watch now (Apple TV)
Claim - recommendation	We recommend this	We suggest [movie name] (Netflix)
Claim - conclusion	This is great	Great value (Booking)
Claim - standpoint	We like this	Amazon's choice (Amazon)
Data	Best-selling item	Bestseller (Amazon, Booking)
Data	3 bought today	Booked [number] times for your dates in the last [number] hours (Booking)
Data	Low in stock	Only [number] rooms left! (Booking)
Data	Because you value price [the most important product attribute]	Because you watched [movie name] (Netflix)

Table 99. Suggestive content PDF manipulations and real-world examples used in the suggestive content pretest 1
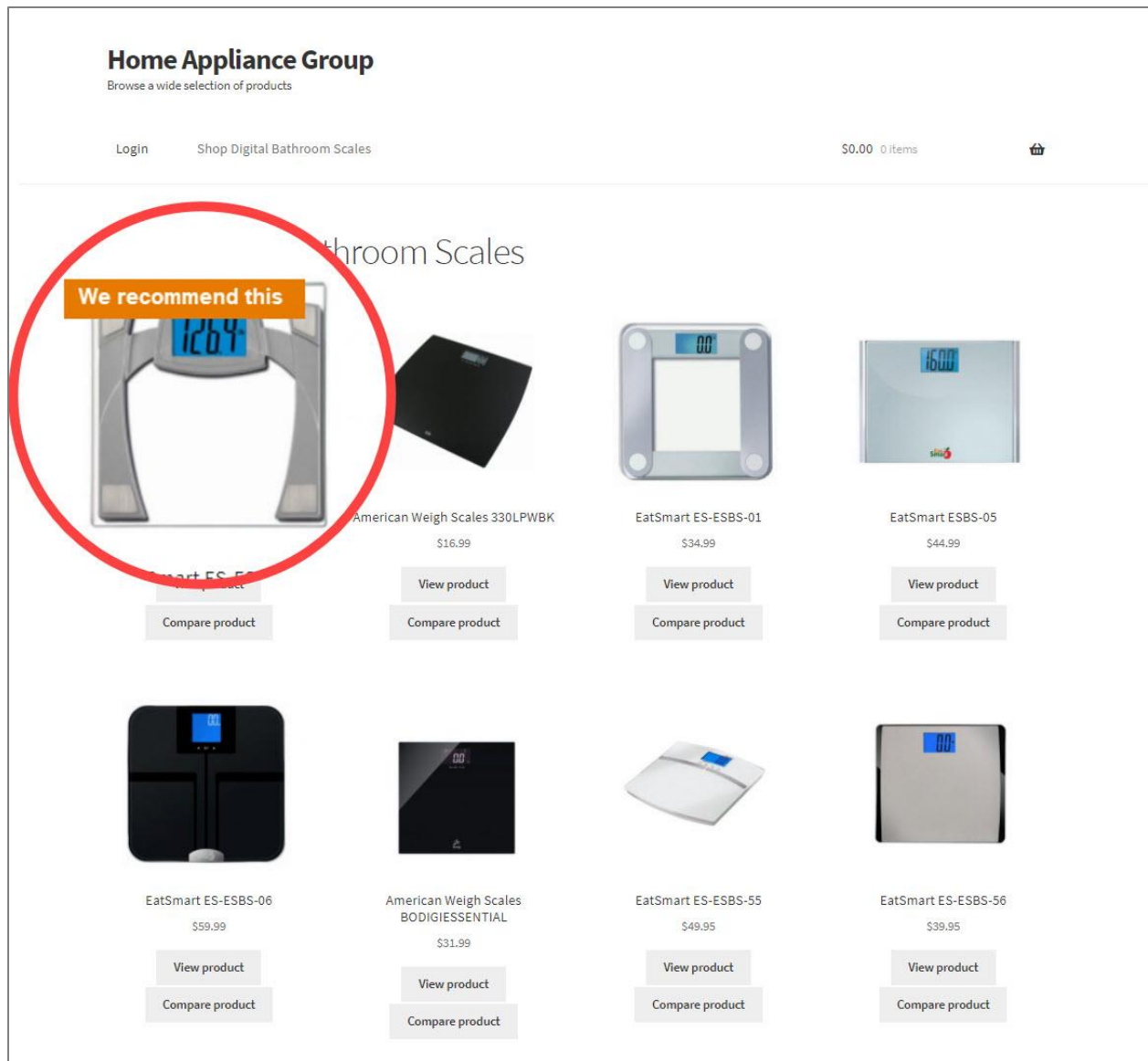
Figure 35. An example of a static screenshot featuring the "we recommend this" content in the suggestive content pretest 1

Measurement. I borrowed scales whenever possible and developed new ones based on definitions from the literature if existing scales are not available. This pretest used a single item to capture each perception. All scale items were randomly presented. Table 100 presents all measurement items used.

Construct	Item	Scale	Source(s)
	To what extent do you agree or disagree with the following statements with respect to the "[suggestive content]" in the above screenshot:	1 = strongly agree to 7 = strongly disagree	
Perceived suggestive – quasi-suggestive design			
Suggestive	… makes an explicit recommendation to you on how to make a decision.		Developed from Silver (2006)
Quasi-suggestive	… does not explicitly make a recommendation, but you can directly infer a recommendation or direction from.		Developed from Silver (2006)
Informative	… offers relevant information enlightening your decision without suggesting or implying how to act.		Developed from Silver (2006)
Perceived argument element			
Claim	… states a conclusion that is put forward for acceptance.		Developed from Toulmin (2003)
Data	… is the factual data.		Developed from Toulmin (2003), Gregor and Benbasat (1999)
Persuasion awareness			

Construct	Item	Scale	Source(s)
Perceived assistive intent	I feel … is trying to help me.		Developed from Robertson and Rossiter (1974)
Perceived persuasive intent	I feel … is trying to direct my decision.		Developed from Robertson and Rossiter (1974)
Perceived appropriateness	… seems acceptable to me.		Campbell (1995)

Table 100. Measurement of the suggestive content pretest 1

Participants. Twenty participants were recruited from Prolific. One participant failed the attention check questions and thus was removed from the analysis, resulting in 19 usable participants.

Manipulation check on perceived suggestive design. A one-way repeated measures ANOVA was conducted to examine the difference in perceived suggestive design among the eight content conditions. The means and standard deviations are presented in Table 101. Results showed a significant effect of suggestive content element, $F(7, 126) = 11.50$, $p < .001$, $\eta_p^2 = .39$ with a large effect size. Follow-up tests using a Bonferroni correction were conducted. Results showed that "buy this item" led to significantly higher perceived suggestive design than the four data elements: "best-selling item," $p = .01$, "3 bought today," $p < .001$, "low in stock," $p < .001$, and "because you value price," $p = .02$. Also, results indicated that "we recommend this" resulted in a significantly higher perceived suggestive design than the following three data elements—"best-selling," $p < .001$, "3 bought today," $p < .001$, "low in stock," $p < .001$—and marginally

significantly higher than one claim element, "we like this," $p = .06$. Also, "this is great" was perceived as significantly higher suggestive than "because you value price," $p = .01$. Thus, "buy this item" and "we recommend this" were more suggestive than the data elements, and "this is great" was more suggestive than "because you value price" only. On the contrary, "we like this" was not different from the data elements. The manipulation of suggestive content was relatively successful. Figure 36 presents the difference in perceived suggestive design across the eight conditions

Suggestive Content PDF	Mean	Standard Deviation
Buy this item	6.16	1.57
We recommend this	5.89	1.52
This is great	4.84	1.50
We like this	4.84	1.71
Best-selling item	3.47	1.71
3 bought today	3.00	1.60
Low in stock	3.26	1.79
Because you value price	4.47	1.61

Table 101. Means and standard deviations of perceived suggestive content PDFs in the suggestive content pretest 1
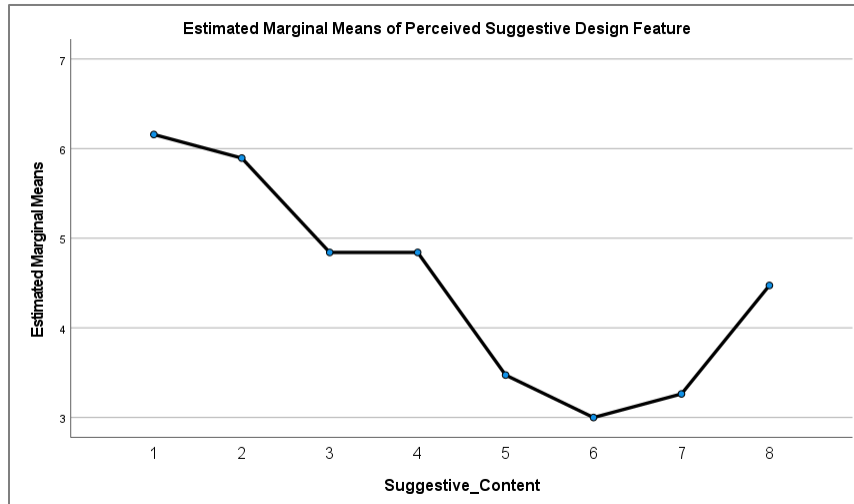
Note: 1 – buy this item, 2 – we recommend this, 3 – this is great, 4 – we like this, 5 – best-selling item, 6 – 3 bought today, 7 – low in stock, 8 – because you value price

Figure 36. The difference in perceived suggestive design in the suggestive content pretest 1

Manipulation check on perceived quasi-suggestive design. I conducted a one-way repeated measures ANOVA to investigate the difference in perceived quasi-suggestive design across all eight suggestive content elements. The means and standard deviations are reported in Table 102. There was a significant difference in perceived quasi-suggestive design, $F(7, 126) = 10.34$, $p < .001$, $\eta_p^2 = .37$ with a large effect size. Follow-up tests using a Bonferroni correction were conducted. Results reveal that "buy this item" led to significantly lower perceived suggestive design than the four data elements: "best-selling item," $p = .03$, "3 bought today," $p < .001$, "low in stock," $p < .001$, and "because you value price," $p = .04$. Also, it showed a significantly lower perceived quasi-suggestive design than "we like this," $p = .03$. Additionally, the results demonstrate that "we recommend this" resulted in a significantly lower perceived quasi-suggestive design than the following three data elements: "best-selling," $p = .01$, "3 bought today," $p < .001$, "low in stock," $p < .001$. Therefore, "best-selling item," "3 bought today," and "low in stock" were more quasi-suggestive than the two claim elements, "buy this item" and "we recommend this." "Because you value price" was more quasi-suggestive than "buy this item" only. Perceived quasi-

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suggestive design shows a reverse pattern to perceived suggestive design. Thus, the quasi-suggestive design manipulation was relatively successful. Figure 37 shows the difference in perceived quasi-suggestive design across all suggestive content elements.

Suggestive Content PDF	Mean	Standard Deviation
Buy this item	2.37	1.98
We recommend this	3.00	1.80
This is great	4.47	2.27
We like this	4.84	2.01
Best-selling item	5.58	1.81
3 bought today	5.63	1.26
Low in stock	5.68	0.82
Because you value price	4.68	1.97

Table 102. Means and standard deviations of perceived quasi-suggestive design in the suggestive content pretest 1

Note: 1 – buy this item, 2 – we recommend this, 3 – this is great, 4 – we like this, 5 – best-selling item, 6 – 3 bought today, 7 – low in stock, 8 – because you value price

Figure 37. The difference in perceived quasi-suggestive design in the suggestive content pretest 1

Manipulation check on perceived suggestive – quasi-suggestive design. I ran a one-way repeated measures ANOVA to test the difference in perceived suggestive – quasi-suggestive design among all eight suggestive content elements. This analysis was based on mean differences

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between suggestive and quasi-suggestive design perception. The smallest difference suggests more quasi-suggestive design, whereas the largest difference shows more suggestive design. The means and standard deviations are reported in Table 103. A significant difference in perceived suggestive – perceived quasi-suggestive design was found, $F(7, 126) = 16.40$, $p < .001$, $\eta_p^2 = .48$ with a large effect size. Next, I conducted follow-up tests using a Bonferroni correction. Results points that "buy this item" had a significantly higher perceived suggestive – quasi-suggestive design than "this is great," $p = .04$, "we like this," $p = .01$, "best-selling item," $p < .001$, "3 bought today," $p < .001$, "low in stock," $p < .001$, and "because you value price," $p < .001$. Results also shows that "we recommend this" had a significantly higher perceived suggestive – quasi-suggestive design than "we like this," $p = .04$, "best-selling item," $p < .001$, "3 bought today," $p < .001$, and "low in stock," $p < .001$. Also, "because you value price" had a significantly higher perceived suggestive – quasi-suggestive design than "3 bought today," $p = .02$. In particular, "buy this item" and "we recommend this" were more suggestive than quasi-suggestive, with "buy this item" stimulating the highest perceived suggestive design. On the other hand, "best-selling item," "3 bought this," and "low in stock" were perceived to be more quasi-suggestive design than suggestive one, with "3 bought this" maximizing perceived quasi-suggestive one. The difference in perceived suggestive – quasi-suggestive design across all conditions is depicted in Figure 38.

Suggestive Content PDF	Mean	Standard Deviation
Buy this item	3.79	2.46
We recommend this	2.89	3.02
This is great	0.37	3.48
We like this	0.00	2.49
Best-selling item	-2.11	2.77
3 bought today	-2.63	1.89

Suggestive Content PDF	Mean	Standard Deviation
Low in stock	-2.42	2.04
Because you value price	-0.21	2.18

Table 103. Means and standard deviations of perceived suggestive - perceived quasi-suggestive design in the suggestive content pretest 1
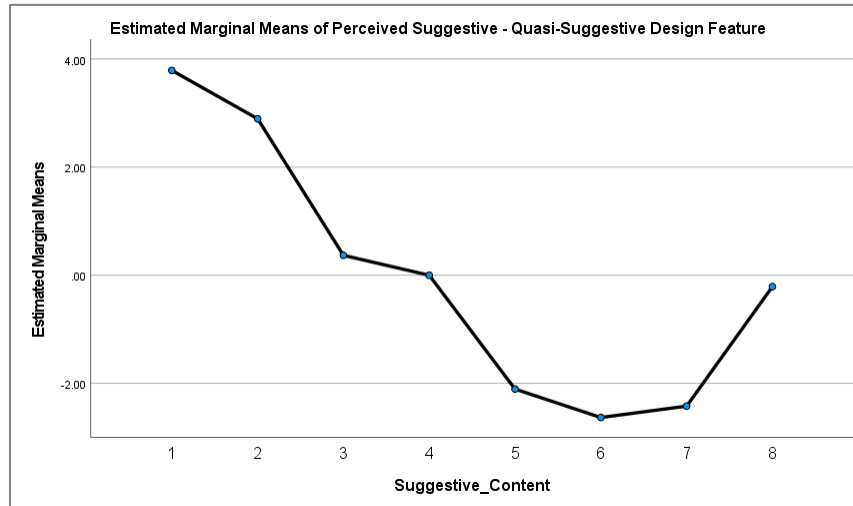
Note: 1 – buy this item, 2 – we recommend this, 3 – this is great, 4 – we like this, 5 – best-selling item, 6 – 3 bought today, 7 – low in stock, 8 – because you value price

Figure 38. The difference in perceived suggestive - quasi-suggestive design in the suggestive content pretest 1

Manipulation check on perceived informative design. Perceived informative design serves as a surrogate for data content measurement. I ran a one-way repeated measures ANOVA to examine the difference in perceived informative design. The means and standard deviations appear in Table 104. Results indicate a significant difference in perceived informative design across all eight conditions, $F(7, 126) = 7.29$, $p < .001$, $\eta_p^2 = .29$ with a large effect size. Follow-up tests using a Bonferroni correction were conducted. Results show that "best-selling item" led to significantly higher perceived informative design than the three claim element conditions—"buy this item," $p = .01$, "this is great," $p = .01$, and "we like this," $p = .04$. Results also present that "3 bought today" resulted in a significantly higher perceived informative design than all four claim conditions— "buy this item," $p = .05$. "Low in stock" was perceived to be significantly more informative than the three claim conditions—"buy this item," $p < .001$, "this is great," $p < .001$, and "we like this,"

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$p = .01.$, as well as marginally significant more than "we recommend this," $p = .06$. Lastly, results indicate that "because you value price" caused a significantly higher perceived informative design than all four claim conditions—"buy this item," $p = .01$, "we recommend this," $p = .04$, "this is great," $p = .01$, and "we like this," $p = .01$. Therefore, all four data conditions generally induced a higher perceived informative design than the three claim conditions. The manipulation of data content was successful. Figure 39 depicts the difference in perceived informative design across all eight conditions.

Suggestive Content PDF	Mean	Standard Deviation
Buy this item	2.32	1.73
We recommend this	3.42	1.74
This is great	2.84	1.80
We like this	3.05	1.72
Best-selling item	4.95	1.87
3 bought today	5.21	1.62
Low in stock	5.53	1.31
Because you value price	5.00	1.70

Table 104. Means and standard deviations of perceived informative design in the suggestive content pretest 1
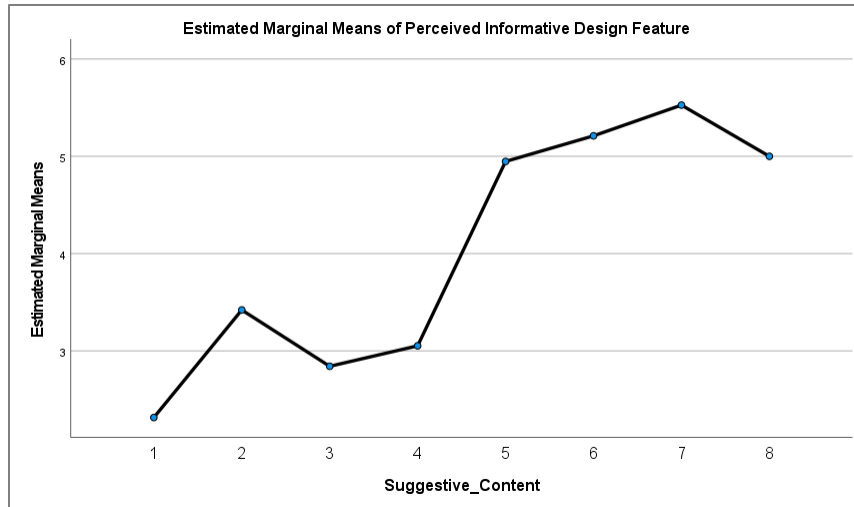
Note: 1 – buy this item, 2 – we recommend this, 3 – this is great, 4 – we like this, 5 – best-selling item, 6 – 3 bought today, 7 – low in stock, 8 – because you value price

Figure 39. The difference in perceived informative design in the suggestive content pretest 1

Manipulation check on perceived claim element. In addition to perceived suggestive and quasi-suggestive design, I employ perceived claim content as a claim manipulation check. A one-way repeated measures ANOVA was conducted to measure the difference in perceived claim content among the eight suggestive content PDFs. The means and standard deviations present in Table 105. As a sphericity assumption was not met, I implemented a Greenhouse-Geisser correction. A significant difference in perceived claim element was not found, $F(7, 126) = 1.82$, $p = .14$, $\eta_p^2 = .09$ with a medium effect size. The medium effect size suggests that there might be a difference among conditions and that this pretest did not have sufficient power to detect this difference. The difference in perceived claim content among all conditions is featured in Figure 40.

Suggestive Content PDF	Mean	Standard Deviation
Buy this item	4.21	2.15
We recommend this	5.00	1.67
This is great	5.00	1.76
We like this	5.11	1.73
Best-selling item	5.42	0.84

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Suggestive Content PDF	Mean	Standard Deviation
3 bought today	4.11	1.82
Low in stock	4.53	1.50
Because you value price	4.58	1.71

Table 105. Means and standard deviations of perceived claim content in the suggestive content pretest 1
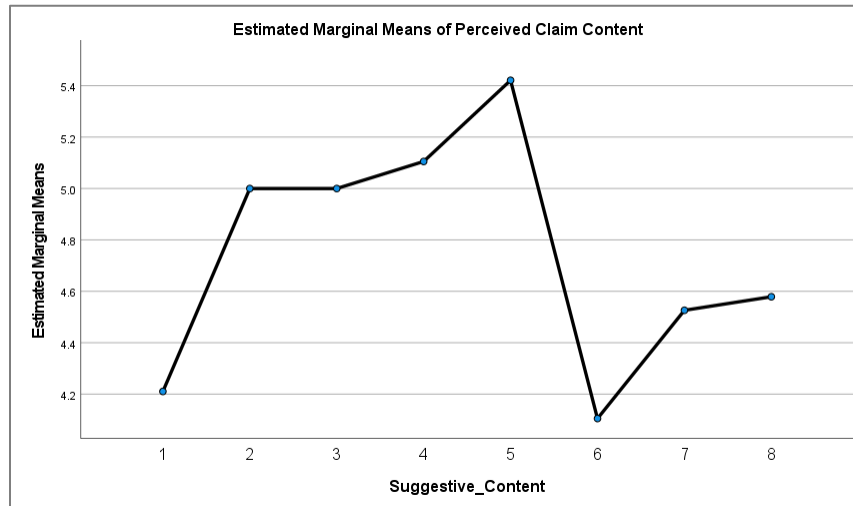
Note: 1 – buy this item, 2 – we recommend this, 3 – this is great, 4 – we like this, 5 – best-selling item, 6 – 3 bought today, 7 – low in stock, 8 – because you value price

Figure 40. The difference in perceived claim content in the suggestive content pretest 1

Manipulation check on perceived data element. In addition to perceived informative design, I utilized perceived data content as a measure of the data manipulation. A one-way repeated measures ANOVA was run to assess the differences in perceived data content among the eight suggestive content PDFs. The means and standard deviations appeared in Table 106. As a sphericity assumption was not met, I used a Greenhouse-Geisser correction. A significant difference in perceived data element was found, $F(7, 126) = 20.28$, $p < .001$, $\eta_p^2 = .53$ with a large effect size. Follow-up tests using a Bonferroni correction were conducted. Results suggest that "best-selling item" was significantly perceived to be more like a data element than "buy this item," $p = .01$, "this is great," $p = .01$, and "we like this," $p < .001$. Results also indicate that "3 bought today" was perceived to have a significantly higher data element than "buy this item," $p < .001$,

"we recommend this," $p = .01$, "this is great," $p < .001$, "we like this," $p < .001$, and "because you value price," $p < .001$. Participants significantly perceived "low in stock" to be more like a data element than "buy this item," $p < .001$, "we recommend this," $p = .05$, "this is great," $p < .001$, "we like this," $p < .001$, and "because you value price," $p = .01$. As a result, "best-selling item," "3 bought today," and "low in stock" were perceived to align with a data element. The difference in perceived data content among all conditions is featured in Figure 41.

Suggestive Content PDF	Mean	Standard Deviation
Buy this item	2.26	1.45
We recommend this	3.42	1.81
This is great	2.32	1.34
We like this	2.53	1.43
Best-selling item	4.95	1.93
3 bought today	5.89	1.10
Low in stock	5.16	1.34
Because you value price	3.05	1.84

Table 106. Means and standard deviations of perceived data element in the suggestive content pretest 1
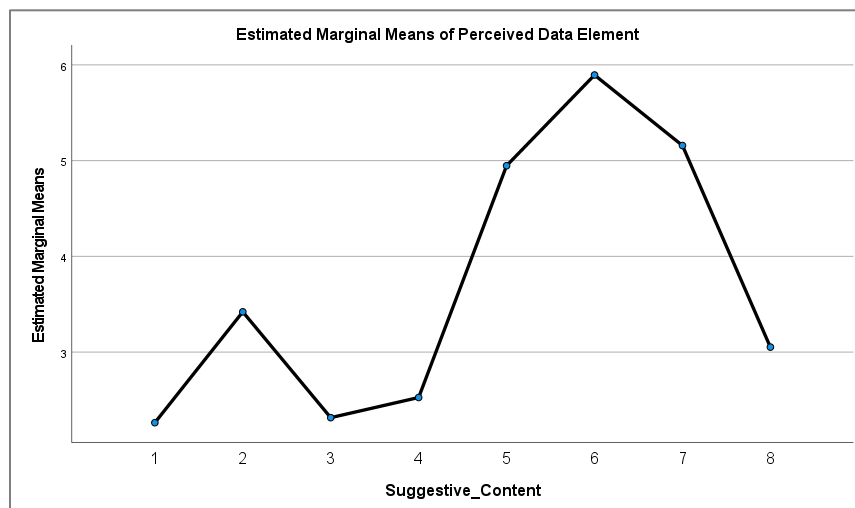
Note: 1 – buy this item, 2 – we recommend this, 3 – this is great, 4 – we like this, 5 – best-selling item, 6 – 3 bought today, 7 – low in stock, 8 – because you value price
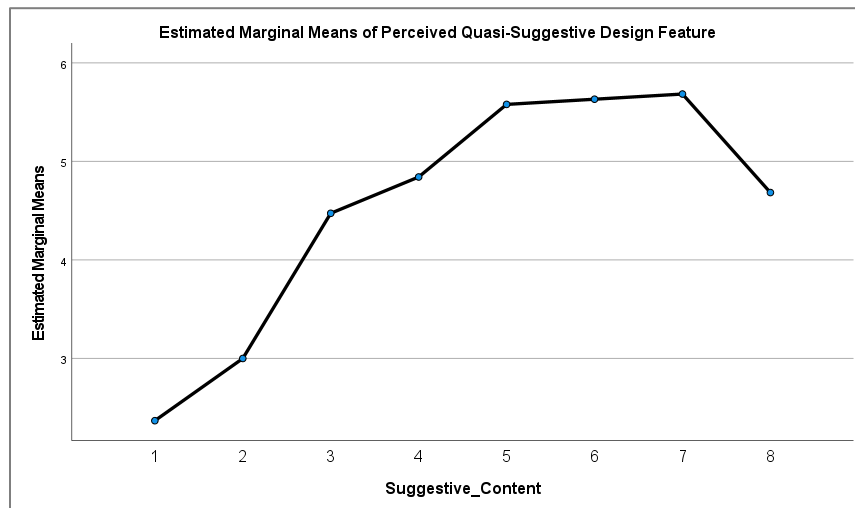
Figure 41. The difference in perceived data element in the suggestive content pretest 1

Results on perceived persuasive intent. A one-way repeated measures ANOVA was conducted to examine the effect of suggestive content on perceived persuasive intent. The means and standard deviations present in Table 107. A significant effect of suggestive content was found, $F(7, 126) = 3.57$, $p < .001$, $\eta_p^2 = .17$ with a large effect size. Follow-up tests using a Bonferroni correction was run. Results reveal that "buy this item" caused a significantly higher perceived persuasive intent than "best-selling item," $p = .04$, "3 bought today," $p = .01$, and "low in stock," $p = .02$. This suggests that "buy this item" could stimulate a high degree of perceived persuasive intent, as well as "best-selling item," "3 bought today," and "low in stock" could generate a low degree of perceived persuasive intent. See the difference in perceived persuasive intent across all conditions in Figure 42.

Suggestive Content PDF	Mean	Standard Deviation
Buy this item	6.63	1.01
We recommend this	6.11	1.37
This is great	6.00	1.49
We like this	6.16	0.83
Best-selling item	5.53	1.47
3 bought today	5.11	1.45
Low in stock	5.47	1.07
Because you value price	6.00	1.05

Table 107. Means and standard deviations of perceived persuasive intent in the suggestive content pretest 1
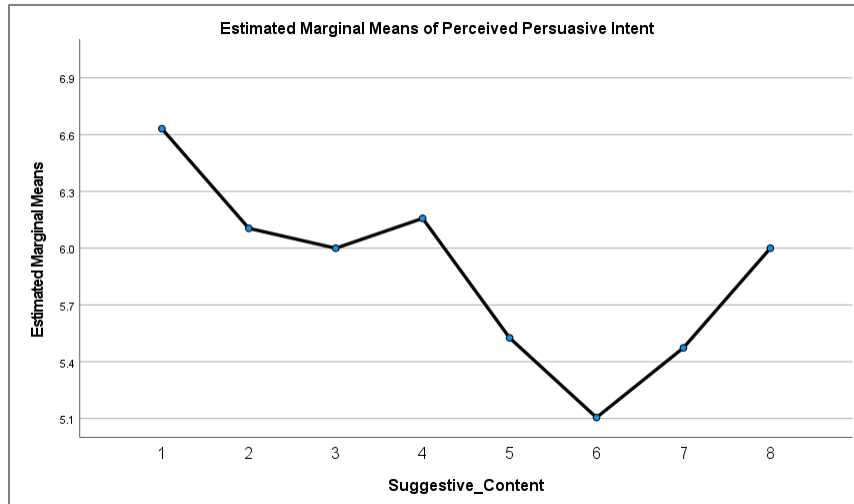
Note: 1 – buy this item, 2 – we recommend this, 3 – this is great, 4 – we like this, 5 – best-selling item, 6 – 3 bought today, 7 – low in stock, 8 – because you value price

Figure 42. The effect of suggestive content on perceived persuasive intent 1

Results on perceived assistive intent. I ran a one-way repeated measures ANOVA to investigate the effect of suggestive content on perceived assistive intent. The means and standard deviations are shown in Table 108. There was a significant effect of suggestive content, $F(7, 126) = 8.64$, $p < .001$, $\eta_p^2 = .32$ with a large effect size. Follow-up tests using a Bonferroni correction was conducted. Results show that "buy this item" induced a significantly lower perceived assistive intent than "we recommend this," $p < .001$, "we like this," $p = .02$, and "best-selling item," $p < .001$, "low in stock," $p < .001$, and "because you value price," $p = .01$. Also, results demonstrate that "this is great" led to a lower degree of perceived assistive intent than "we recommend this," $p = .03$, and "best-selling item," $p = .01$. Specifically, "buy this item" could instigate a low level of perceived assistive intent, while "best-selling" and "we recommend" could result in a higher perceived assistive intent. See the difference in perceived assistive intent across all conditions in Figure 43.

Suggestive Content PDF	Mean	Standard Deviation
Buy this item	2.79	1.78

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Suggestive Content PDF	Mean	Standard Deviation
We recommend this	4.79	1.36
This is great	3.47	1.65
We like this	4.16	1.26
Best-selling item	5.21	1.18
3 bought today	4.32	1.60
Low in stock	4.63	1.38
Because you value price	5.11	1.49

Table 108. Means and standard deviations of perceived assistive intent in the suggestive content pretest 1
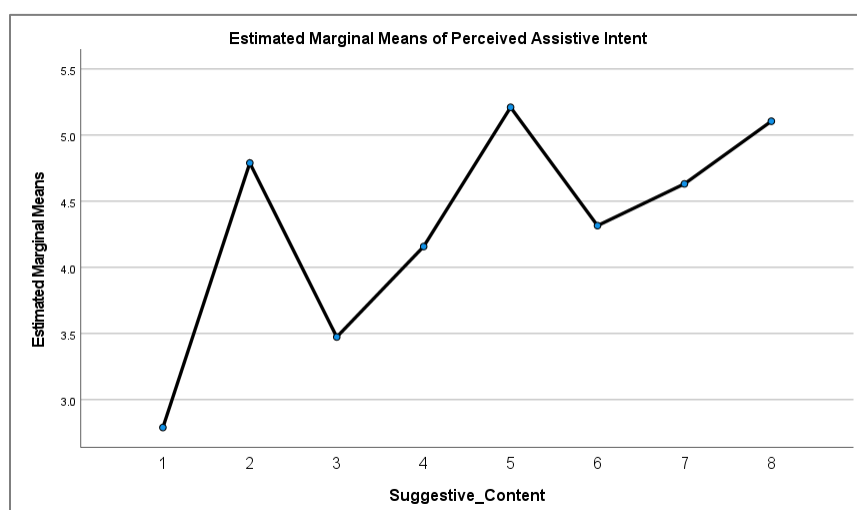
Note: 1 – buy this item, 2 – we recommend this, 3 – this is great, 4 – we like this, 5 – best-selling item, 6 – 3 bought today, 7 – low in stock, 8 – because you value price

Figure 43. The effect of suggestive content on perceived assistive intent in the suggestive content pretest 1

Conclusion. As the objective of this pretest is to identify the suggestive content design features that were successfully manipulated in terms of suggestive – quasi-suggestive design/claim content and informative/data content, as well as influenced low/high perceived assistive and low/high perceived persuasive intent, I initially chose the four content elements based on these two perceptions. Accordingly, "buy this item" with lowest assistive – highest persuasive, "we recommend this" with high assistive – high persuasive, "3 bought today" with low assistive (lowest among all data elements) – lowest persuasive, and "best-selling" with highest assistive – low

persuasive were selected. Additionally, the two claim elements, "buy this item" and "we recommend this," successfully reflected suggestive design/claim content, whereas the two data elements, "best-selling item" and "3 bought today," effectively showed quasi-suggestive and informative/data content. However, "3 bought today" would be context dependent. In different words, if the number of products bought changes, then the individuals' perceived assistive and/or persuasive intent will change. For example, "100 bought today" would induce higher perceived assistive intent than "3 bought today." As a result, "low in stock" that showed successful quasi-suggestive and informative design/data element, and sufficient low perceived assistive intent and persuasive intent was selected instead. These four content elements will be subsequently tested in the next pretest. Table 109 and Figure 44 presents the chosen conditions and their perceived assistive and persuasive intent.

Perceived Assistive Intent	Perceived Persuasive Intent	
	Low	High
Low	Low in stock (data) [4.63, 5.47]	Buy this item (claim) [2.79, 6.63]
High	Best-selling item (data) [5.21, 5.53]	We recommend this (claim) [4.79, 6.11]

Table 109. Chosen suggestive content PDFs in the suggestive content pretest 1

Means of Perceived Assistive - Persuasive Intent
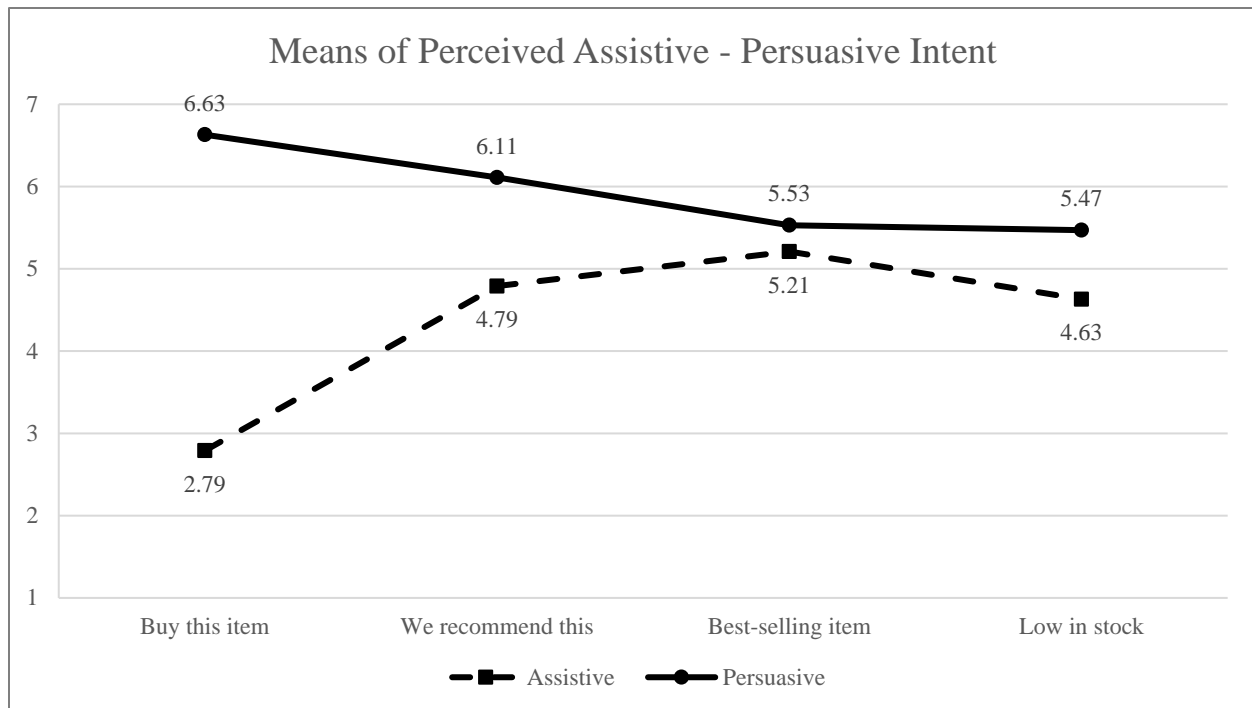
Figure 44. Differences in perceived assistive and persuasive intent in the suggestive content pretest 1

E.4   Suggestive Content Pretest 2

Objective. The previous pretest (suggestive content pretest 1) supported the four suggestive content features— "buy this item," "we recommend this," "best-selling item," and "low in stock"—influenced different degrees of perceived assistive and persuasive intent. However, perceived persuasive intent was inflated, compared with the pretests in the past. This could result from highlighting suggestive content and a within-subjects design without a control condition. With highlighted content, its effect would be more pronounced. Also, a within-subjects design created a learning effect. Without a standard comparison group as a control condition, it was hard to evaluate the results. As a result, I did not highlight suggestive content and employed a between-subjects design with a control condition in this current pretest to assess whether highlighted content and a within-subjects design would be a confound (suggestive content pretest 1). In addition,

unlike a single-item measurement used in the previous pretest, I used a multiple-item measurement that was used in the subsequent study. In sum, this current test assessed the effects of the four suggestive content PDFs, "buy this item," "we recommend this," "best-selling item," and "low in stock," plus one control design, on perceived assistive, persuasive intent, and perceived appropriateness, using a static website screenshot.

Method. A 5 (*suggestive content*: control, buy this item, we recommend this, best-selling item, low in stock) between-subjects design was conducted. The five conditions present in Table 110. In the treatment conditions, suggestive content was manipulated in the same way as the previous pretest (suggestive content pretest 1), except that there was no highlighted content and that there were four products shown (vs. eight items in the previous pretest). If eight products were shown without highlighted content, suggestive content looked relatively small and hard to read. Thus, I decided to show only four products instead. Figure 45 depicts an example of a static screenshot used in the "we recommend this" condition. Participants were randomly assigned to one of the five conditions.

Suggestive Content PDF	Manipulation
Control	No manipulation
Claim	Buy this item
Claim	We recommend this
Data	Best-selling item
Data	Low in stock

Table 110. Suggestive content PDF manipulations used in the suggestive content pretest 2
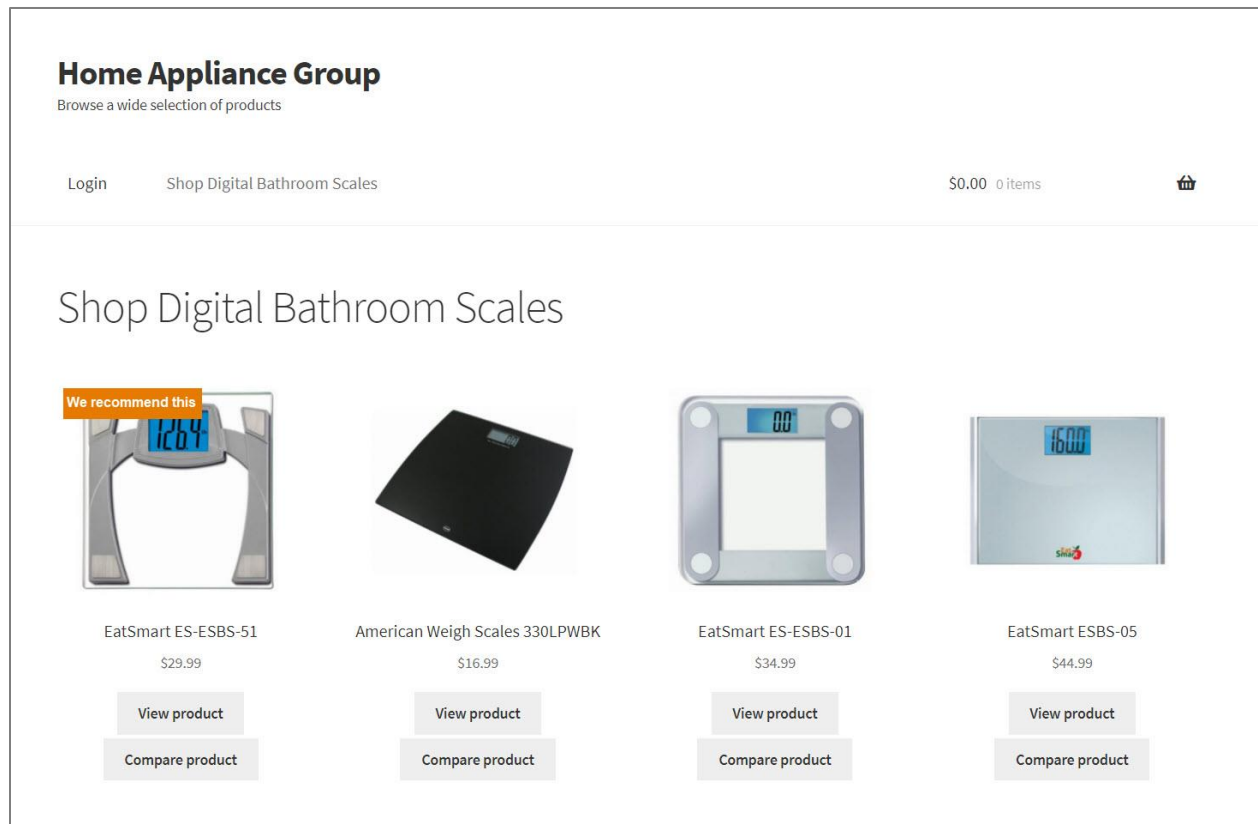
Figure 45. An example of a static screenshot featuring the "we recommend this" content in the suggestive content pretest 2

Procedure. First, participants were asked to read a scenario (see Figure 46) and then evaluate a static screenshot in their respective condition. Their task was to evaluate the website design. Next, they were asked to complete the questionnaire survey which captured their perceptions regarding manipulation checks, perceived assistive intent, perceived persuasive intent, perceived appropriateness, attitudes towards the website, and intention to use it. Lastly, they were asked to answer questions regarding their demographics (age, marital status, education, gender, and income). Once they completed the questionnaire survey, they received a participation reward of £1.

Assume that you are going to buy a new digital bathroom scale for yourself. You want to buy it on the Internet. After your evaluation of all available online websites, you have found **homeappliancegroup.com**, which provides a wide selection of scales.

As a result, assume you are now entering homeappliancegroup.com to buy a scale. You are exploring the scale models on the website. You can spend as much time as you like on the website to evaluate models and identify one model you seriously consider purchasing for yourself.

Once you choose the scale you would seriously consider purchasing for yourself, you will be asked to answer questions regarding how you used the website, your purchasing decision, and how you felt about the website design.

Please note that there are no right or wrong answers here, we are just interested in getting an honest and detailed description of your behavior and perception towards homeappliancegroup.com.

Figure 46. Scenario in the suggestive content pretest 2

Measurement. I borrowed scales whenever possible and developed new ones based on definitions from the literature if existing scales are not available. This pretest employed multiple items to measure each construct. If there were more than one scale item in each block (1 – 4), all scale items were randomly presented. A scale item was excluded from analysis if it showed a low internal consistency reliability and discriminant validity. Table 111 reports all measurement items used.

Construct	Item	Scale	Source(s)	Cronbach's Alpha
1. Consequences				
	Please evaluate homeppliancegroup.com in the following aspects:	Seven-point semantic differential scale		
1. Manipulation checks				

Construct	Item	Scale	Source(s)	Cronbach's Alpha
Suggestive design	... did not make a recommendation. – ... made an explicit recommendation.		Al-Natour et al. (2006)	0.80
	... did not provide a suggestion in terms of what option to select. – ... provided an explicit suggestion in terms of what option to select.		Al-Natour et al. (2006)	
	... explicitly suggested a specific course of action. – ... did not suggest a specific course of action. (R)		Al-Natour et al. (2006)	Removed
Informative	... did not provide useful information. – ... provided useful information.		Developed from Silver (2006)	0.80
	... was uninformative. – ... was informative.		Developed from Silver (2006)	
	... provided relevant information. – ... did not provide relevant information. (R)		Developed from Silver (2006)	
Claim content	... did not state a conclusion put forward for acceptance. – ... stated a conclusion put forward for acceptance.		Developed from Toulmin (2003)	0.68
	... did not make an assertion. – ... made an assertion.		Developed from	

Construct	Item	Scale	Source(s)	Cronbach's Alpha
			Toulmin (2003)	
	... made a claim. – ... did not make a claim. (R)		Developed from Toulmin (2003)	Removed
Data content	... did not give the factual data. – ... gave the factual data.		Developed from Toulmin (2003), Gregor and Benbasat (1999)	0.66
	... did not provide an evidence. – ... provided an evidence.		Developed from Toulmin (2003), Gregor and Benbasat (1999)	
	... offered supporting information. – ... did not offer supporting information. (R)		Developed from Toulmin (2003), Gregor and Benbasat (1999)	Removed

Construct	Item	Scale	Source(s)	Cronbach's Alpha
	To what extent do you agree or disagree with the following statements with respect to the homeappliancegroup.com in the above screenshot:	1 = strongly agree to 7 = strongly disagree		
2. Persuasion awareness				
Perceived assistive intent	I feel … is trying to help me.		Developed from Robertson and Rossiter (1974)	0.83
	I perceive ... was trying to assist me.		Developed from Robertson and Rossiter (1974)	
	I do not feel ... attempted to help me. (R)		Developed from Robertson and Rossiter (1974)	
Perceived persuasive intent	... tried to make me act in a certain way.		Al-Natour et al. (2006)	0.87

Construct	Item	Scale	Source(s)	Cronbach's Alpha
	... tried to direct my decision.		Al-Natour et al. (2006)	
	... did not try to influence me to perform a certain action. (R)		Developed from Robertson and Rossiter (1974)	
Perceived appropriateness	The way ... designed its design features seems acceptable to me.		Campbell (1995)	0.76
	I think that the design features of ... are appropriate.		Campbell (1995)	
	The design features of ... are not fair in what were shown. (R)		Campbell (1995)	
4. Consequences				
	To what extent did you feel the design of homeppliancegroup.com was:	Seven-point semantic differential scale		
Attitudes towards the website	Good – Bad			0.88
	Unfavorable – Favorable			
	Likable – Dislikable			
	To what extent do you agree or disagree with the following	1 = strongly agree to 7 =		

Construct	Item	Scale	Source(s)	Cronbach's Alpha
	statements with respect to the homeappliancegroup.com in the above screenshot:	strongly disagree		
Intention to use the website	I intend to use ... in the future.		Pavlou and Fygenson (2006)	0.91
	I predict I would use ... in the future.			
	I do not plan to use ... in the future. (R)			

Note: R – reversed item; removed – removed from analysis due to low reliability

Table 111. Measurement of the suggestive content pretest 2

Participants. One hundred fifty participants were recruited from Prolific. Six participants who failed the attention check questions were removed from the analysis, resulting in 144 usable participants. Table 112 details a sample size in each condition.

Suggestive Content PDF	Total Participants	Usable Participants
Control	30	29
Claim	30	28
Claim	30	29
Data	31	31
Data	29	27

Table 112. Sample size in each experimental condition in the suggestive content pretest 2

Demographics. There were no significant differences in their age ($\chi^2(20) = 15.43$, $p = .75$), marital status ($\chi^2(12) = 11.95$, $p = .45$), education ($\chi^2(20) = 22.88$, $p = .30$), gender ($\chi^2(16) = 16.62$, $p = .41$), and income ($\chi^2(28) = 33.56$, $p = .22$) across all five conditions.

Manipulation check on perceived suggestive design. The means and standard deviations are presented in Table 113. Results from a one-way ANOVA revealed that there was a significant effect of suggestive content, $F(4, 139) = 15.04$, $p < .001$, $\eta_p^2 = .30$ with a large effect size. Follow-up tests using a Bonferroni correction were conducted. Results showed that "buy this item" led to significantly higher perceived suggestive design than the control condition, $p = .01$, and "low in stock," $p = .03$. Also, results indicated that "we recommend this" resulted in a significantly higher perceived suggestive design than the control, $p < .001$, "buy this item," $p = .02$, "best-selling," $p < .001$, and "low in stock," $p < .001$. Also, "best-selling item" was perceived as significantly higher suggestive than the control, $p < .001$. Thus, "we recommend this" was the most suggestive, thereby reflecting a suggestive PDF. "Buy this item" and "Best-selling item" were more suggestive than "low in stock" and/or the control, thus indicating a quasi-suggestive PDF. There was no difference between "low in stock" and the control, thus suggesting no/low suggestive PDF. As a result, the manipulation of suggestive PDF was successful. Figure 47 presents the difference in perceived suggestive design across the five conditions

Suggestive Content PDF	Mean	Standard Deviation
Control	2.67	1.53
Buy this item	4.32	2.05
We recommend this	5.81	1.81
Best-selling item	3.98	1.76
Low in stock	2.91	1.45

Table 113. Means and standard deviations of perceived suggestive content PDFs in the suggestive content pretest 2
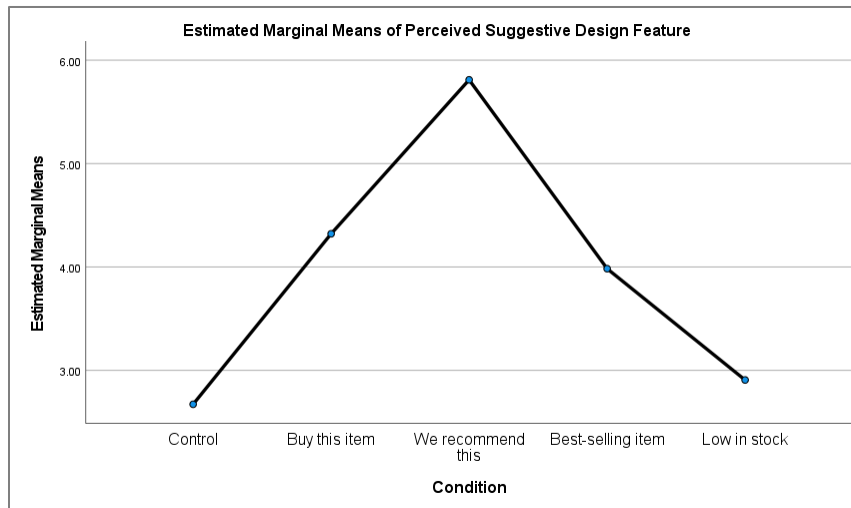
Figure 47. The difference in perceived suggestive design in the suggestive content pretest 2

Manipulation check on perceived informative design. Perceived informative design serves as a surrogate for data content measurement. The means and standard deviations appear in Table 114. Results from a one-way ANOVA indicated a marginally significant difference in perceived informative design across all conditions, $F(4, 139) = 0.69$, $p = .60$, $\eta_p^2 = .02$ with a small effect size. Based on this measure, the manipulation of data content was not successful. Figure 48 depicts the difference in perceived informative design across all conditions.

Suggestive Content PDF	Mean	Standard Deviation
Control	4.09	1.67
Buy this item	4.19	1.57
We recommend this	4.06	1.52
Best-selling item	4.20	1.53
Low in stock	4.65	1.26

Table 114. Means and standard deviations of perceived informative design in the suggestive content pretest 2
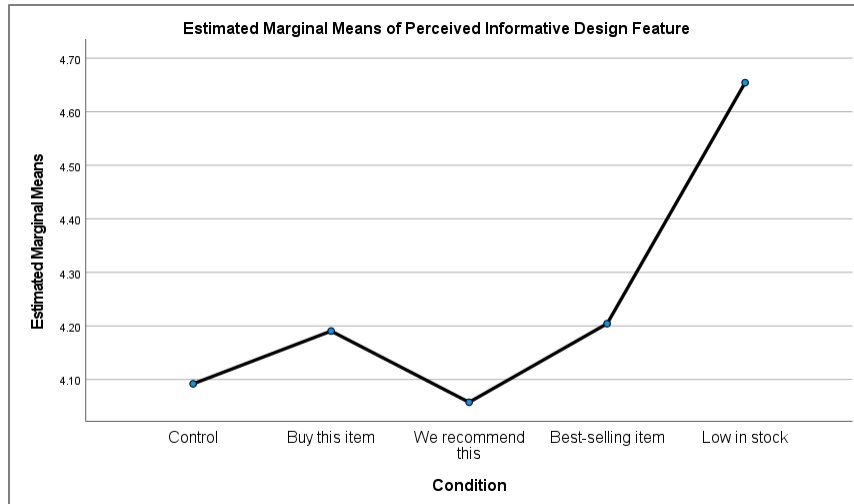
Figure 48. The difference in perceived informative design in the suggestive content pretest 2

Manipulation check on perceived claim element. In addition to perceived suggestive design, I employed perceived claim content as a claim manipulation check. The means and standard deviations present in Table 115. Results from a one-way ANOVA revealed that a significant difference in perceived claim element was found, $F(4, 139) = 2.68, p = .03, \eta_p^2 = .07$ with a medium effect size. Follow-up tests using a Games-Howell correction were run. Results showed that "we recommend this" has significantly higher perceived claim content than the control condition, $p = .04$. Consequently, claim manipulation was relatively successful. That is, a screenshot featuring "we recommend this" had more claim content than a screenshot without suggestive content. However, this was not the case for a screenshot with "buy this item." The difference in perceived claim content among all conditions is featured in Figure 49.

Suggestive Content PDF	Mean	Standard Deviation
Control	2.93	1.35
Buy this item	3.45	1.82
We recommend this	4.19	1.85
Best-selling item	3.73	1.33
Low in stock	3.24	1.47

Table 115. Means and standard deviations of perceived claim content in the suggestive content pretest 2
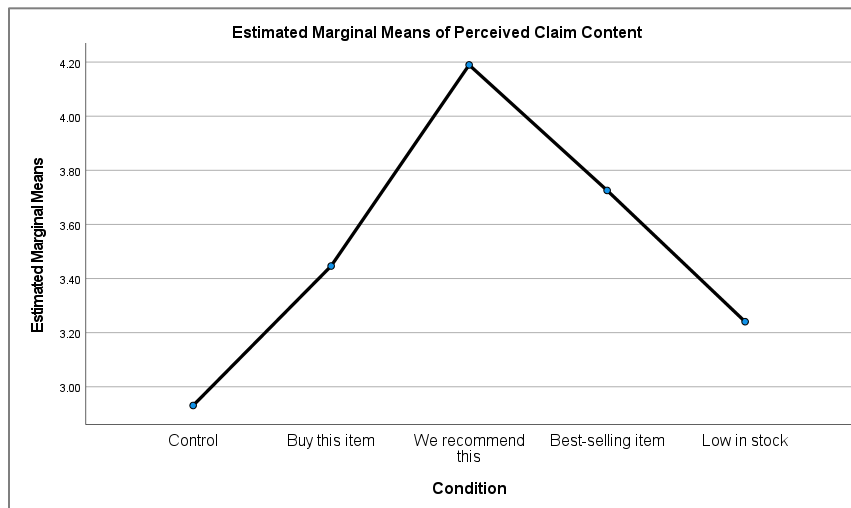
Figure 49. The difference in perceived claim content in the suggestive content pretest 2

Manipulation check on perceived data element. In addition to perceived informative design, I utilized perceived data content as a measure of data manipulation. The means and standard deviations are reported in Table 116. Results from a one-way ANOVA indicated that there was no significant difference in perceived data element, $F(4, 139) = 2.79$, $p = .03$, $\eta_p^2 = .07$ with a medium effect size. Follow-up tests using a Bonferroni correction were implemented. Results revealed that "low in stock" was perceived as significantly higher perceived data content than "we recommend this," $p = .03$. However, the "best-selling item" manipulation did not show more data content. Thus, the manipulation of data content was relatively successful. The difference in perceived data content among all conditions is featured in Figure 50.

Suggestive Content PDF	Mean	Standard Deviation
Control	3.55	1.61
Buy this item	3.70	1.62
We recommend this	3.12	1.66
Best-selling item	4.03	1.48
Low in stock	4.37	1.13

Table 116. Means and standard deviations of perceived data element in the suggestive content pretest 2
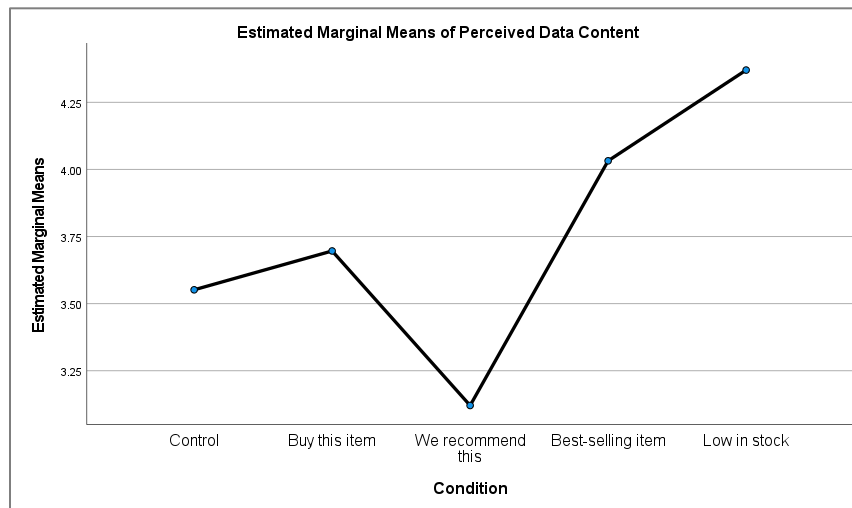
Figure 50. The difference in perceived data element in the suggestive content pretest 2

Results on perceived persuasive intent. The means and standard deviations present in Table 117. Results from a one-way ANOVA revealed that a significant effect of suggestive content was found, $F(4, 139) = 11.04$, $p < .001$, $\eta_p^2 = .24$ with a large effect size. Follow-up tests using a Bonferroni correction was run. Results showed that "buy this item" caused significantly higher perceived persuasive intent than the control condition, $p = .03$, and a marginally significantly higher perceived persuasive intent than "low in stock," $p = .06$. Also, results indicated that "we recommend this" led to a significantly higher perceived persuasive intent than the control $p < .001$, "best-selling item," $p = .01$, and "low in stock," $p < .001$, and a marginally significantly perceived persuasive intent than "buy this item," $p = .09$. Consequently, the suggestive PDFs featuring claim content, "buy this item" and "we recommend this," resulted in higher perceived persuasive intent than the suggestive PDF featuring "best-selling item," "low in stock," and/or no suggestive PDF. See the difference in perceived persuasive intent across all conditions in Figure 51.

Suggestive Content PDF	Mean	Standard Deviation
Control	2.99	1.15

Suggestive Content PDF	Mean	Standard Deviation
Buy this item	4.20	1.79
We recommend this	5.25	1.55
Best-selling item	3.88	1.56
Low in stock	3.09	1.28

Table 117. Means and standard deviations of perceived persuasive intent in the suggestive content pretest 2
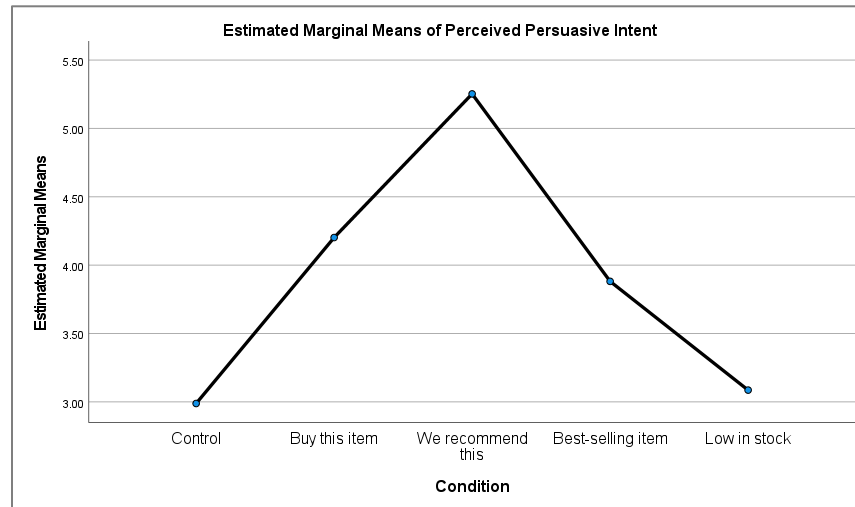
Figure 51. The effect of suggestive content on perceived persuasive intent 2

Results on perceived assistive intent. The means and standard deviations are shown in Table 118. Results from a one-way ANOVA indicated that there was a no significant effect of suggestive content, $F(4, 139) = 0.39$, $p = .82$, $\eta_p^2 = .01$ with a small effect size. Thus, inconsistent with my expectation, the suggestive content PDF did not lead to perceived assistive intent. See the difference in perceived assistive intent across all conditions in Figure 52.

Suggestive Content PDF	Mean	Standard Deviation
Control	4.29	1.46
Buy this item	4.35	1.17
We recommend this	4.34	1.39
Best-selling item	4.43	1.38
Low in stock	4.68	1.03

Table 118. Means and standard deviations of perceived assistive intent in the suggestive content pretest 2
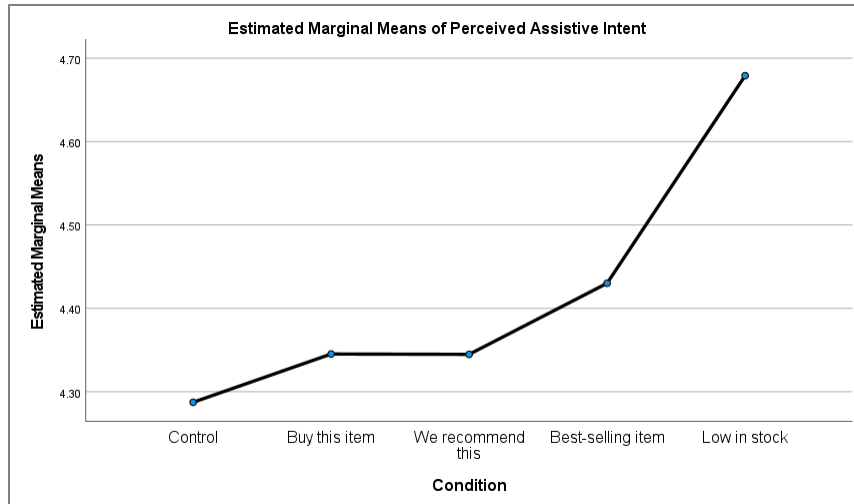
Figure 52. The effect of suggestive content on perceived assistive intent in the suggestive content pretest 2

Measurement model of structural path analysis. SmartPLS 3 was used to evaluate the relationship among perceived persuasive intent, perceived assistive intent, perceived appropriateness, attitudes towards the website, and intention to use the website. According to Barclay et al. (1995), the measurement model was examined in terms of internal consistency reliability and discriminant validity. All items tapped on their respective latent variables, with loadings greater than 0.70 (see Table 119). The internal consistency reliability was evident by the composite reliability and Cronbach's alpha greater than or equal to 0.70 (see Table 120). The square root of AVE of each latent variable was greater than correlations between itself and others (see Table 120). Also, there was no loading higher than the loadings of the respective latent variables (see Table 119). In sum, these supported acceptable discriminant validity.

	Attitudes towards the Website	Intention to Use the Website	Perceived Appropriateness	Perceived Assistive Intent	Perceived Persuasive Intent
Appropriate1	0.65	0.52	**0.93**	0.52	-0.14
Appropriate2	0.64	0.52	**0.93**	0.55	-0.06
Assist1	0.61	0.52	0.54	**0.91**	0.03
Assist2	0.51	0.48	0.53	**0.88**	0.15
Assist3	0.44	0.32	0.39	**0.80**	0.06
Att1	**0.95**	0.59	0.67	0.57	-0.11
Att2	**0.94**	0.62	0.69	0.58	-0.10
Att3	**0.80**	0.43	0.50	0.50	-0.03
Inten1	0.62	**0.96**	0.56	0.54	-0.05
Inten2	0.60	**0.95**	0.55	0.49	-0.12
Inten3	0.47	**0.86**	0.42	0.40	-0.01
Persuasive1	-0.11	-0.02	-0.12	0.07	**0.94**
Persuasive2	-0.07	-0.04	-0.02	0.10	**0.81**
Persuasive3	-0.05	-0.13	-0.08	0.09	**0.87**

Table 119. Loadings and cross loadings in the suggestive content pretest 2

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)	Attitudes towards the Website	Intention to Use the Website	Perceived Appropriateness	Perceived Assistive Intent	Perceived Persuasive Intent
Attitudes towards the Website	0.88	0.93	0.81	0.90				
Intention to Use the Website	0.91	0.95	0.85	0.62	0.92			
Perceived Appropriateness	0.84	0.93	0.86	0.69	0.56	0.93		
Perceived Assistive Intent	0.83	0.90	0.75	0.61	0.52	0.57	0.86	
Perceived Persuasive Intent	0.87	0.91	0.77	-0.09	-0.07	-0.11	0.09	0.88

Note: Off-diagonal – correlations, diagonal – the square root of AVE

Table 120. Internal consistency and discriminant validity in the suggestive content pretest 2

Structural path analysis. The path significance of the structural path model was assessed using bootstrap resampling. Results showed that perceived persuasive intent was not significantly related to perceived appropriateness, $t = 1.67$, $p = .01$, while perceived assistive intent was significantly and positively associated with perceived appropriateness, $t = 11.04$, $p < .001$, $R^2 = 0.36$. That is, perceived persuasive intent did not attribute to perceived appropriateness, while perceived assistive intent had a positive effect on perceived appropriateness. Perceived appropriateness was found to have a significant and positive effect on attitudes towards the website, $t = 13.85$, $p < .001$, $R^2 = 0.48$, which, in turn, had a significant and positive impact on intention to use the website, $t = 10.82$, $p < .001$, $R^2 = 0.38$. The overall constructs explained 38% of the variances in reactance (anger). The structural path model is depicted in Figure 53.
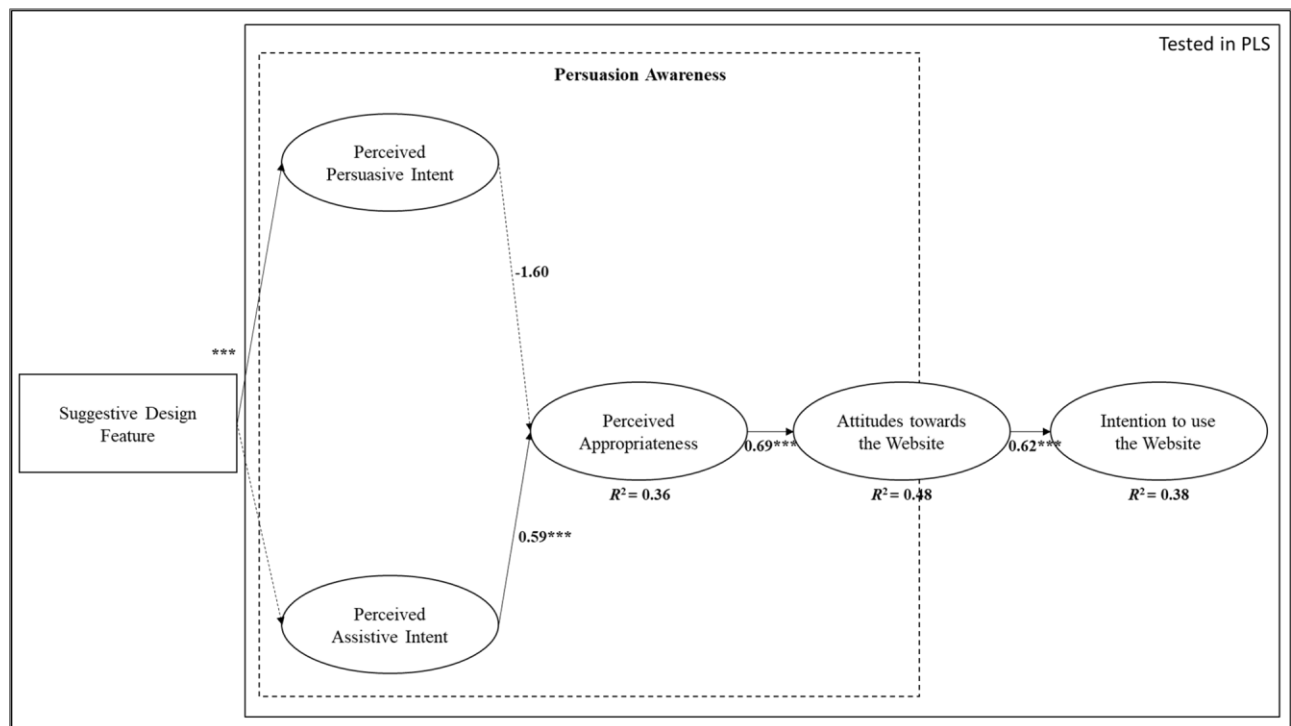
Note: Significant at the level .1, ** significant at level .05, ***significant at level .001, dotted line – non-significant path

Figure 53. Structural path model in the suggestive content pretest 2

Conclusion. This pretest supported that the suggestive content had a positive impact on perceived persuasive intent, while did not influence perceived assistive intent. However, while perceived assistive intent drove perceived appropriateness, perceived persuasive intent did not. Consistent with my expectation, perceived appropriateness was attributed to attitudes towards the website and thus intention to use the website. Table 121 presents perceived assistive and persuasive intent in each condition. Figure 54 shows the differences in perceived assistive and persuasive intent across all conditions. According to this pretest, participants generally perceived higher assistive intent than perceived persuasive intent. In other words, those who were exposed to the suggestive content PDF were less likely to be aware of a persuasion attempt triggered by the PDF, compared to its assistive intent. This suggested that highlighted content and a within-subjects design would influence perceived assistive and persuasive intent in the previous pretest (suggestive content pretest 1).

Perceived Assistive Intent	Perceived Persuasive Intent	
	Low	**High**
Moderate	Control [4.29, 2.99]	
	Low in stock (data) [4.68, 3.09]	Buy this item (claim) [4.35, 4.20]
	Best-selling item (data) [4.43, 3.88]	We recommend this (claim) [4.34, 5.25]

Note: [mean of perceived assistive intent, mean of perceived persuasive intent]

Table 121. Perceived assistive and persuasive intent in the suggestive content pretest 2
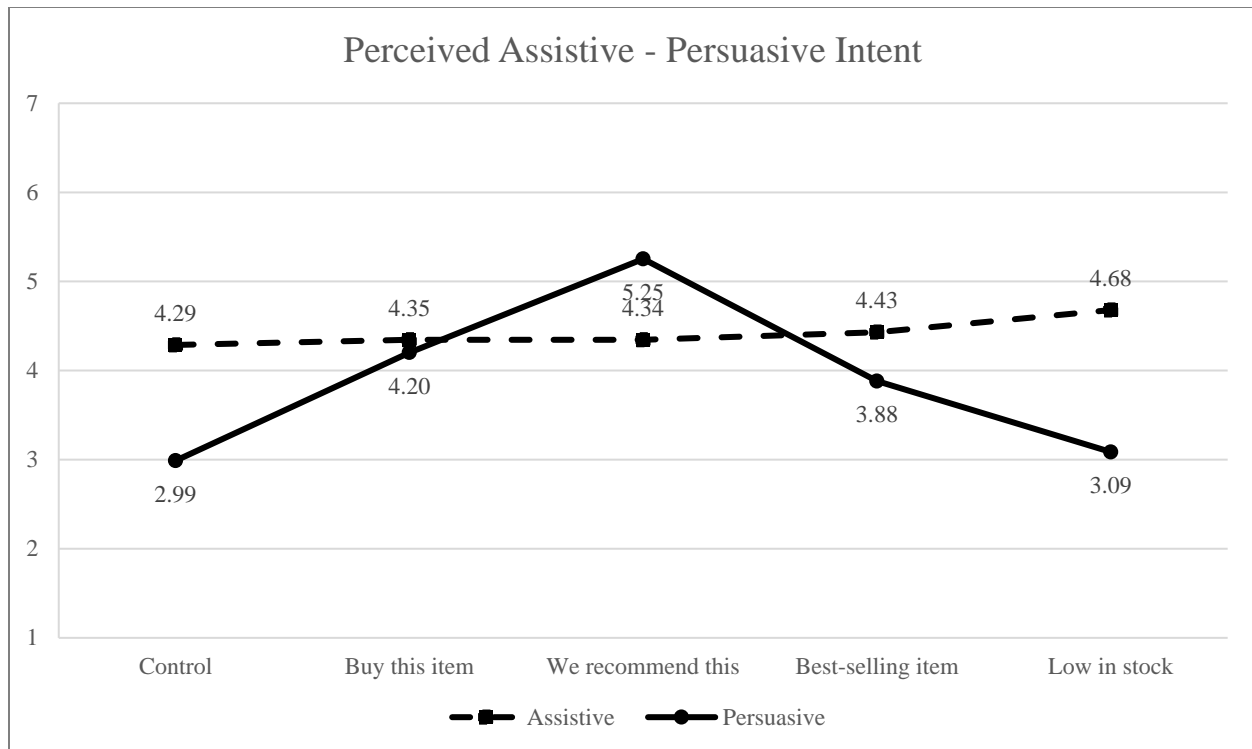
Figure 54. Differences in perceived assistive and persuasive intent in the suggestive content pretest 2

E.5   Suggestive Content Pretest 3

Objective. In the previous pretest (suggestive content pretest 2), I conducted an online experiment that revealed that the suggestive content PDF influenced perceived persuasive intent but not perceived assistive intent. However, inconsistent with my expectation and the results of the past pretests, perceived persuasive intent did not contribute to perceived appropriateness. It also shows that perceived assistive intent attributed to perceived appropriateness, while perceived persuasive intent did not. This could result from a static screenshot with four product alternatives. As the dual-process theories note, individuals are more likely to evaluate information if it does not load their cognitive effort (Chaiken 1980; Petty and Cacioppo 1986b). In this case, the peripheral cues, such as the suggestive content PDF, will have less effect. As a result, in this pretest, I increased the number of product choices to reflect a real online setting with a large amount of information. Also, an experimental e-commerce website was used. That is, participants were asked to interact with a

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website and then required to make a product selection. This will elevate ecological validity. Like the previous pretest, I employed a multiple-item measurement that was used in the subsequent main study of Empirical study 1. Accordingly, this current test evaluated the effects of the four suggestive content PDFs, "buy this item," "we recommend this," "best-selling item," and "low in stock," plus one control design, on perceived assistive, persuasive intent, and perceived appropriateness in an experimental website setting. Attitudes towards the website and intention to use the website were excluded from this pretest, as they received much support from my past pretests and existing literature (e.g., Campbell 1995). Additionally, I added one construct, reactance, to be tested as one outcome of perceived assistive and persuasive intent in this test. Reactance was added, as extant literature suggests that reactance will result from persuasion attempts (Fitzsimons and Lehmann 2004). The objective of this test was to examine whether the four suggestive content PDFs replicated the results of the previous pretest.

Method. A 5 (*suggestive content*: control, buy this item, we recommend this, best-selling item, low in stock) between-subjects design was implemented. The five conditions present in Table 122.

Suggestive Content PDF	Manipulation
Control	No manipulation
Claim	Buy this item
Claim	We recommend this
Data	Best-selling item
Data	Low in stock

Table 122. Suggestive content PDF manipulations used in the suggestive content pretest 3

Experimental website. An experimental website, called Home Appliance Group (homeappliancegroup.com), offered forty digital bathroom scales with nine product attributes (see Table 86). Prior research used the number in the range of 50 alternatives to reflect moderate task

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complexity (54 alternatives, Kamis et al. 2008; 50 alternatives, Xu et al. 2014) and the 24 – 30 range for extensive options (Iyengar 1987). Also, extant literature utilized 5 – 9 product attributes to represent a moderate level of component complexity (6 attributes, Jiang and Benbasat 2007; 7+/-2, Miller 1956; 8 attributes, Xu et al. 2014). Moderate complexity is suitable, as low complexity does not reflect real-world e-commerce websites and would limit the effect of suggestive content PDF manipulation, and high complexity could cause a ceiling effect that would diminish the manipulation effect well. However, there were 40 digital bathroom scales in the $15.00 – $100 price range available on Bestbuy.com on October 1, 2018. Accordingly, I chose 40 product alternatives with the nine important product attributes based on the results of the task product pretest to present a moderate level of task and component complexity. For the treatment conditions, a suggestive content element was attached to the first product item. An example screenshot for the "we recommend this" is presented in Figure 55. Participants were randomly assigned to access one of the five conditions. In all conditions, the website provides a comparison feature that allows participants to compare products up to six items at a time by clicking "Compare product" and "View product." I set the maximum number of products compared to 6, since existing literature shows that consumers generally consider products (consideration set) in the range of 3 – 6 (Hauser and Wernerfelt 1990). Thus, a compare feature that allows users to compare products up to 6 is enough to reflect their consideration set size. Also, they could view product detail by clicking a "View product" button.
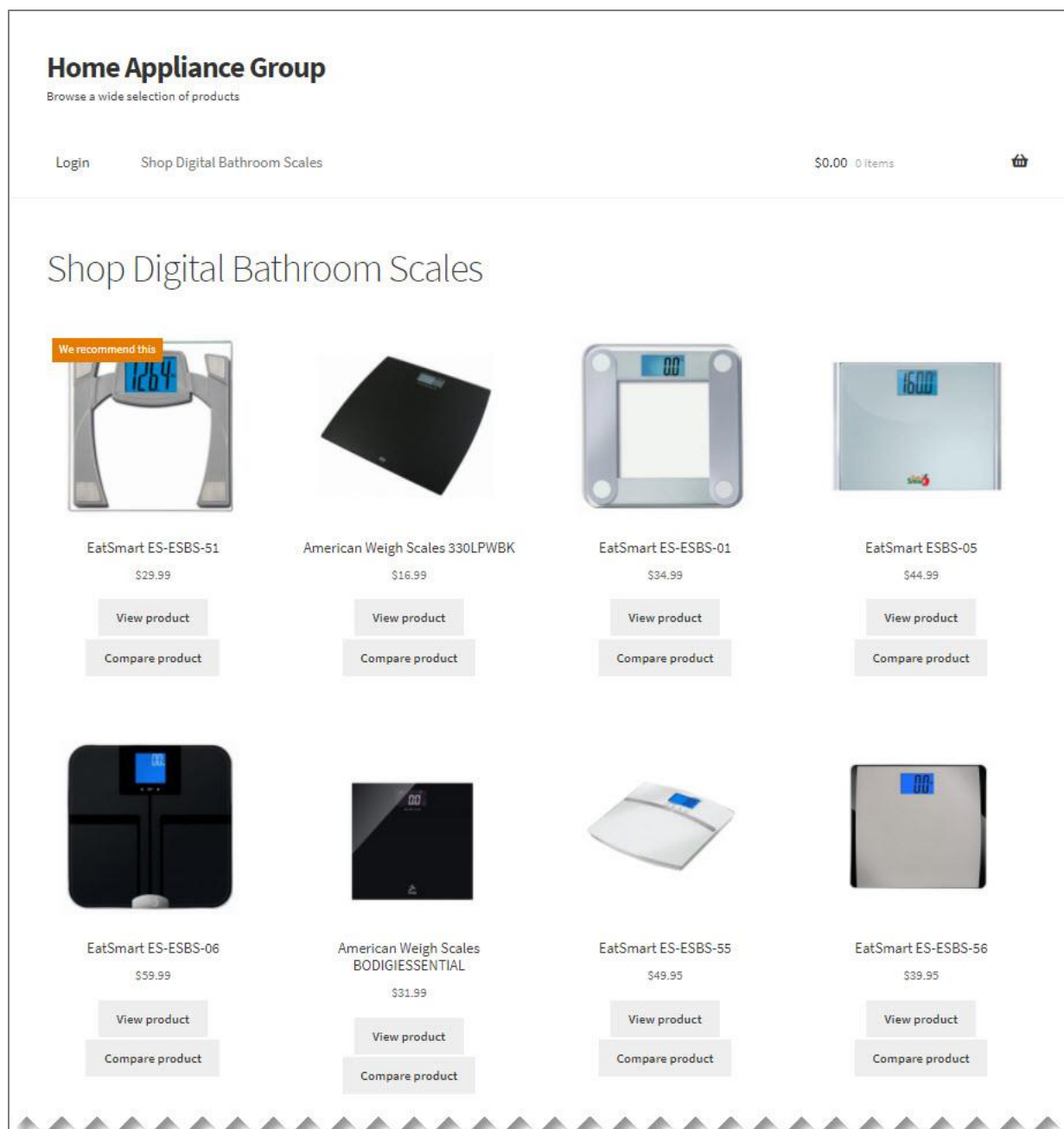
Figure 55. An example of a screenshot of an experimental website featuring the "we recommend this" content in the suggestive content pretest 3

Procedure. First, participants were asked to complete a pre-questionnaire survey which measured their demographics (age, marital status, education, gender, and income). Next, they were asked to read a scenario (see Figure 56), website instructions and a tutorial, and then visit the website in their respective condition. Their task was to evaluate the website design and choose one product

they would seriously consider purchasing. A tutorial explaining how the website works was given

to them (see Figure 57). However, the tutorial used different products, wireless headphones, to

avoid possible confounds. Once they checked out the product, they were asked to complete the

post-questionnaire survey which captured their perceptions regarding manipulation checks,

perceived assistive intent, perceived persuasive intent, perceived appropriateness, and reactance.

To increase their involvement with this pretest, I paid a bonus (up to £1) to those who seriously

did the task and provided a serious, diligent response. Once participants completed the post-

questionnaire survey, they received a participation reward of £1.5.

Assume that you are going to buy a new digital bathroom scale for yourself. You want to buy it on the Internet. After your evaluation of all available online websites, you have found **homeappliancegroup.com**, which provides a wide selection of scales.

As a result, assume you are now entering homeappliancegroup.com to buy a scale. You are exploring the scale models on the website. You can spend as much time as you like on the website to evaluate models and identify one model you seriously consider purchasing for yourself.

Once you choose the scale you would seriously consider purchasing for yourself, you will be asked to answer questions regarding how you used the website, your purchasing decision, and how you felt about the website design.

Please note that there are no right or wrong answers here, we are just interested in getting an honest and detailed description of your behavior and perception towards homeappliancegroup.com.

Figure 56. Scenario in the suggestive content pretest 3

To show how our website works, we will use the Wireless Headphones page.

On the shop page, you will be presented with 40 product choices.

- You can click on each product picture, product name, or "View product" to see more information about the product.

- The website allows you to compare up to 6 products at a time. To compare products, click on "Compare product" button of product you are interested in and then click on "View compare". You can click on "X" to remove a product or "Clear all" to remove all products from comparison.

After clicking "**View product**", you will be directed to the product detail page.

JBuds Pro Signature

$19.99

| 1 | Add to cart |

➡ Click "**Add to cart**" to add a product to your cart.

Compare product

➡ Click "**Compare product**" to add a product to comparison.

Additional information   >

Additional information

Brand	JLab Audio
Headphone fit	In-ear
Sound isolating	Yes
Water resistant	Yes
Battery life (hours)	6
Battery charge time (hours)	5
Weight (grams)	16
Warranty terms (months)	24

Home Appliance Group
Browse a wide selection of products

Login   Shop Wireless Headphones $0.00   0 items   🛒

Shop Wireless Headphones

JBuds Pro Signature	Sony WI-C300	Insignia NS-CAHBTEBNC-S	Sony C400
$19.99	$49.99	$79.99	$69.99
View product	View product	View product	View product
View compare	View compare	View compare	Compare product

Click "**View compare**" to see the product comparison.

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Compare Products

CLEAR ALL ➡ Click "**CLEAR ALL**" to clear all products from comparison.

PRODUCT INFO	X REMOVE	X REMOVE	X REMOVE ➡ Click "**X REMOVE**" to remove a product from comparison.
	JBuds Pro Signature [ADD TO CART]	Sony WI-C300 [ADD TO CART]	Insignia NS-CAHBTEBNC-S [ADD TO CART] ➡ Click "**ADD TO CART**" to add a product to your cart.
PRICE	$19.99	$49.99	$79.99
BRAND	JLab Audio	Sony	Insignia
HEADPHONE FIT	In-ear	In-ear	In-ear neckband
SOUND ISOLATING	Yes	No	Yes
WATER RESISTANT	Yes	No	No
BATTERY LIFE (HOURS)	6	8	8
BATTERY CHARGE TIME (HOURS)	5	2	2
WEIGHT (GRAMS)	16	15	57
WARRANTY TERMS (MONTHS)	24	12	12
	[ADD TO CART]	[ADD TO CART]	[ADD TO CART] ➡ Click "**ADD TO CART**" to add a product to your cart.

You can spend as much time as you like to evaluate product choices. Participants who seriously do the task will be eligible for an additional bonus.

Once you select one product you would seriously consider purchasing, click "Add to cart" and then "Place order".

- If you want to edit your cart, click on the basket icon on the top right.

Home Appliance Group
Browse a wide selection of products

Login   Shop Wireless Headphones

$19.99 1 item

If you want to remove the product from your cart, click the "**basket**" icon.

View your shopping cart

Checkout

"JBuds Pro Signature" has been added to your cart.

Are you sure to place an order? If so, please click "Place order" to proceed to the post-questionnaire survey.

Your order

Product	Subtotal
JBuds Pro Signature × 1	$19.99
Subtotal	$19.99
Shipping	Free shipping
Total	$19.99

Place order

Once clicking "Place order", you will be redirected to the post-questionnaire survey.
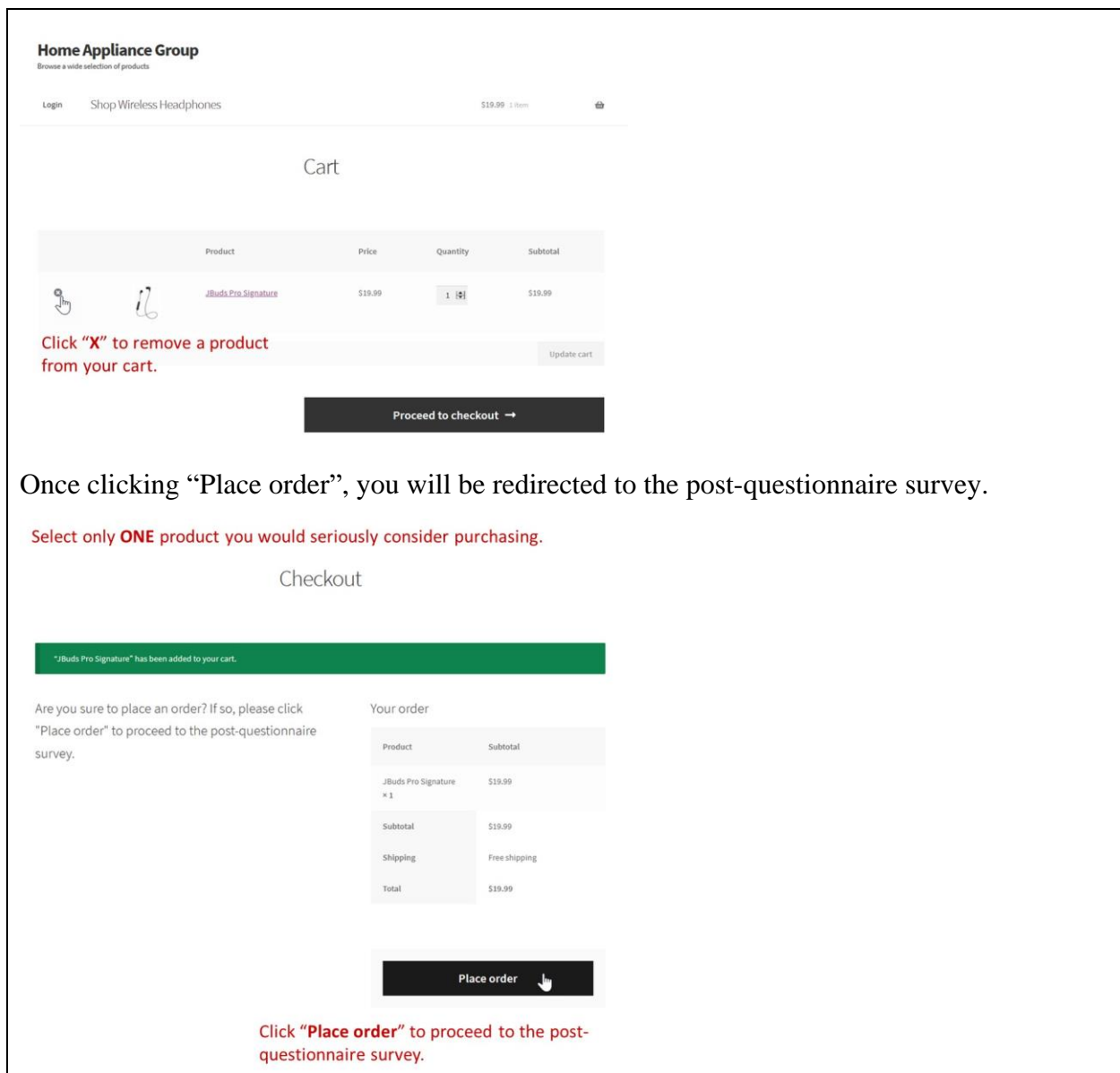
Figure 57. A tutorial used in the suggestive content pretest 3

Measurement. I borrowed scales whenever possible and developed new ones based on definitions from the literature if existing scales are not available. This pretest employed multiple items to measure each construct. If there were more than one scale item in each block (1 – 4), all scale items were randomly presented. A scale item was excluded from analysis if it showed a low internal consistency reliability and discriminant validity. Table 123 reports all measurement items used.

Construct	Item	Scale	Source(s)	Cronbach's Alpha
1. Consequences				
Reactance				
- Negative cognition	List all thoughts that came to your mind when interacting with homeappliancegroup.com.	Open-ended	Dillard and Shen (2005)	N/A
	Please evaluate homeppliancegroup.com in the following aspects:	Seven-point semantic differential scale		
2. Manipulation checks				
Suggestive design	... did not make a recommendation. – ... made an explicit recommendation.		Al-Natour et al. (2006)	0.88
	... did not provide a suggestion in terms of what option to select. – ... provided an explicit suggestion in terms of what option to select.		Al-Natour et al. (2006)	
	... explicitly suggested a specific course of action. – ... did not suggest a specific course of action. (R)		Al-Natour et al. (2006)	Removed
Informative	... did not provide useful information. – ... provided useful information.		Developed from Silver (2006)	0.80
	... was uninformative. – ... was informative.		Developed from Silver (2006)	

Construct	Item	Scale	Source(s)	Cronbach's Alpha
	... provided relevant information. – ... did not provide relevant information. (R)		Developed from Silver (2006)	
Claim content	... did not state a conclusion put forward for acceptance. – stated a conclusion put forward for acceptance.		Developed from Toulmin (2003)	0.69
	... did not make an assertion. – ... made an assertion.		Developed from Toulmin (2003)	
	... made a claim. – ... did not make a claim. (R)		Developed from Toulmin (2003)	Removed
Data content	... did not give the factual data. – ... gave the factual data.		Developed from Toulmin (2003), Gregor and Benbasat (1999)	0.48
	... did not provide an evidence. – ... provided an evidence.		Developed from Toulmin (2003), Gregor and	

Construct	Item	Scale	Source(s)	Cronbach's Alpha
			Benbasat (1999)	
	... offered supporting information. – ... did not offer supporting information. (R)		Developed from Toulmin (2003), Gregor and Benbasat (1999)	
	To what extent do you agree or disagree with the following statements with respect to the homeappliancegroup.com in the above screenshot:	1 = strongly agree to 7 = strongly disagree		
3. Persuasion awareness				
Perceived assistive intent	I feel … is trying to help me.		Developed from Robertson and Rossiter (1974)	0.90
	I perceive ... was trying to assist me.		Developed from Robertson and Rossiter (1974)	

Construct	Item	Scale	Source(s)	Cronbach's Alpha
	I do not feel ... attempted to help me. (R)		Developed from Robertson and Rossiter (1974)	
Perceived persuasive intent	... tried to make me act in a certain way.		Al-Natour et al. (2006)	0.80
	... tried to direct my decision.		Al-Natour et al. (2006)	
	... did not try to influence me to perform a certain action. (R)		Developed from Robertson and Rossiter (1974)	
Perceived appropriateness	The way ... designed its design features seems acceptable to me.		Campbell (1995)	0.77
	I think that the design features of ... are appropriate.		Campbell (1995)	
	The design features of ... are not fair in what were shown. (R)		Campbell (1995)	
4. Consequences				
Reactance				

Construct	Item	Scale	Source(s)	Cronbach's Alpha
	Answer the following question with respect to homeappliancegroup.com:	1 = none to 7 = a great deal		
- Anger	Did you feel angry while interacting with homeappliancegroup.com?		Dillard and Shen (2005)	0.94
	Did you feel annoyed while interacting with homeappliancegroup.com?		Dillard and Shen (2005)	
	Did you feel irritated while interacting with homeappliancegroup.com?		Dillard and Shen (2005)	
	Did you feel aggravated while interacting with homeappliancegroup.com?		Dillard and Shen (2005)	

Note: R – reversed item; removed – removed from analysis due to low reliability

Table 123. Measurement of the suggestive content pretest 3

Additionally, objective measures were adopted to measure participants' targeted product consideration (targeted product compared and targeted product viewed), the number of products consideration (the number of products compared and the number of products viewed), and targeted product chosen. Product consideration measures were from Google Analytics that tracked all events each participant performed when interacting with the website. Product consideration was captured by adding a product to compare using a comparison feature and clicking a "view product" to see product detail. When participants clicked a specific product to cart, their final product choice was recorded.

Participants. One hundred fifty participants were recruited from Prolific. Participants who used an incorrect username to access the website, added more than one product to cart, spend less than 60 seconds on the website, and failed the attention check questions were removed from the analysis, resulting in 130 usable participants, with 95 event-tracked participants. Table 124 details a sample size in each condition concerning each selection criteria.

Criteria	Detail	Control	Buy this item	We recommend this	Best-selling item	Low in stock	Total
Wrong username	Correct username	5	0	0	0	0	5
	Wrong username	30	27	28	28	32	145
Order more than one item	One item	2	0	0	0	2	4
	More than one item	33	27	28	28	30	146
Website time >= 60 sec	Failed	2	0	1	0	0	3
	Passed	33	27	27	28	32	147
Attention checks	Failed	1	1	3	2	2	9
	Passed	34	26	25	26	30	141
GA track	No track	10	10	7	3	7	37
	Track	25	17	21	25	25	113
Total	N	35	27	28	28	32	150
Usable sample	N	26	26	24	26	28	130
Usable sample with GA	N	17	17	17	23	21	95

Table 124. Sample size in the experimental conditions in the suggestive content pretest 3

Demographics. There were no significant differences in their age ($\chi^2(20) = 26.08$, $p = .16$), marital status ($\chi^2(16) = 13.37$, $p = .65$), education ($\chi^2(28) = 30.12$, $p = .36$), gender ($\chi^2(12) = 12.56$, $p = .40$), and income ($\chi^2(24) = 13.73$, $p = .95$) across all five conditions.

Manipulation check on perceived suggestive design. The means and standard deviations are presented in Table 125. Results from a one-way ANOVA revealed that there was a significant effect of suggestive content, $F(4, 125) = 11.30$, $p < .001$, $\eta_p^2 = .27$ with a large effect size. Follow-up tests using a Games-Howell correction were conducted. Results showed that "buy this item" led to marginally significantly higher perceived suggestive design than "best-selling item," $p = .08$. Also, results indicated that "we recommend this" resulted in a significantly higher perceived suggestive design than the control, $p < .001$, "best-selling," $p = .02$, and "low in stock," $p < .001$—and marginally significantly higher than "buy this item," $p = .06$. Also, "best-selling item" was perceived as significantly higher suggestive than "low in stock," $p = .03$, and marginally significantly higher suggestive than the control condition, $p = .06$. Thus, "we recommend this" was the most suggestive, thereby reflecting a suggestive PDF. "Buy this item" and "Best-selling item" were more suggestive than "low in stock" and the control, thus indicating a quasi-suggestive PDF. There was no difference between "low in stock" and the control, thus suggesting no/low suggestive PDF. As a result, the manipulation of suggestive PDF was relatively successful. Figure 58 presents the difference in perceived suggestive design across the five conditions.

Suggestive Content PDF	Mean	Standard Deviation
Control	2.65	1.75
Buy this item	4.02	2.29
We recommend this	5.54	1.51
Best-selling item	4.00	1.78

Suggestive Content PDF	Mean	Standard Deviation
Low in stock	2.55	1.73

Table 125. Means and standard deviations of perceived suggestive content PDFs in the suggestive content pretest 3
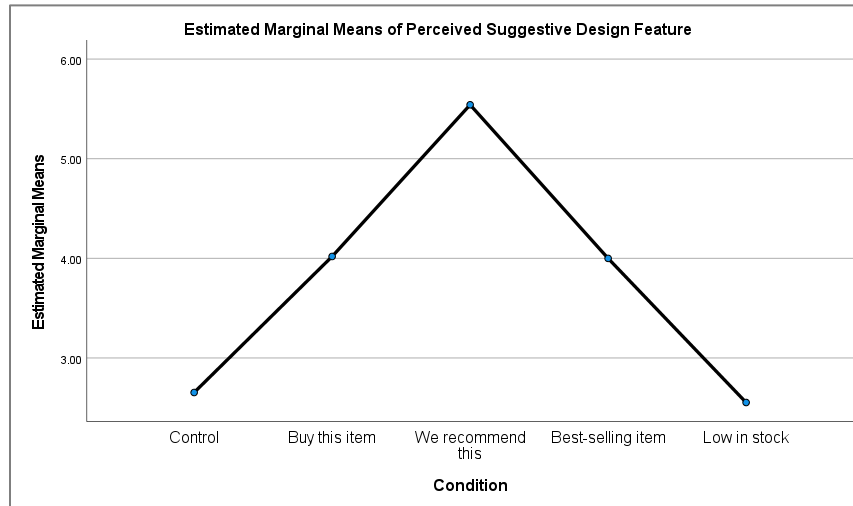
Figure 58. The difference in perceived suggestive design in the suggestive content pretest 3

Manipulation check on perceived informative design. Perceived informative design serves as a surrogate for data content measurement. The means and standard deviations appear in Table 126. Results from a one-way ANOVA indicated a marginally significant difference in perceived informative design across all conditions, $F(4, 125) = 2.19$, $p = .07$, $\eta_p^2 = .07$ with a medium effect size. The medium effect size suggests that there might be a difference among conditions and that this pretest did not have sufficient power to detect this difference. Follow-up tests using a Games-Howell correction were conducted. Results showed that "buy this item" led to a significantly lower perceived informative design than the control condition, $p = .04$. Therefore, "buy this item" was less informative than the control, whereas "we recommend this," "best-selling item," and "low in stock" were not different from the control. The manipulation of data content was not that successful. Figure 59 depicts the difference in perceived informative design across all conditions.

Suggestive Content PDF	Mean	Standard Deviation
Control	6.27	0.89
Buy this item	5.40	1.24
We recommend this	5.50	1.40
Best-selling item	5.82	1.26
Low in stock	5.39	1.57

Table 126. Means and standard deviations of perceived informative design in the suggestive content pretest 3
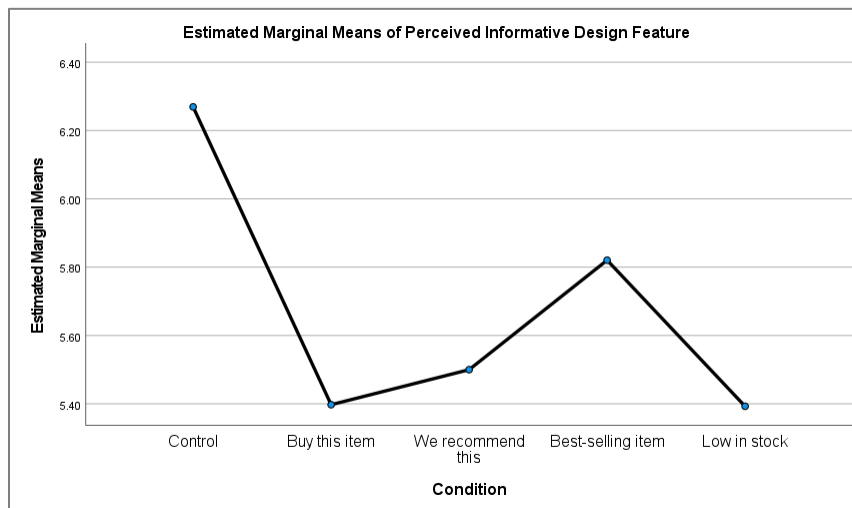
Figure 59. The difference in perceived informative design in the suggestive content pretest 3

Manipulation check on perceived claim element. In addition to perceived suggestive design, I employed perceived claim content as a claim manipulation check. The means and standard deviations present in Table 127. Results from a one-way ANOVA revealed that a significant difference in perceived claim element was found, $F(4, 125) = 2.41, p = .05, \eta_p^2 = .07$ with a medium effect size. Follow-up tests using a Bonferroni correction were run. Results showed that "low in stock" has marginally significantly lower perceived claim content than "buy this item," $p = .09$ and "we recommend this," $p = .09$.   The inconsistence between F-test and pairwise comparison results from the fact that the pairwise comparison is not as powerful as the overall F-test. Consequently, claim manipulation was relatively successful. That is, "buy this item" and "we

recommend this" were more claim content than "low in stock." The difference in perceived claim content among all conditions is featured in Figure 60.

Suggestive Content PDF	Mean	Standard Deviation
Control	3.44	1.72
Buy this item	3.79	1.52
We recommend this	3.81	1.15
Best-selling item	3.48	1.65
Low in stock	2.66	1.66

Table 127. Means and standard deviations of perceived claim content in the suggestive content pretest 3
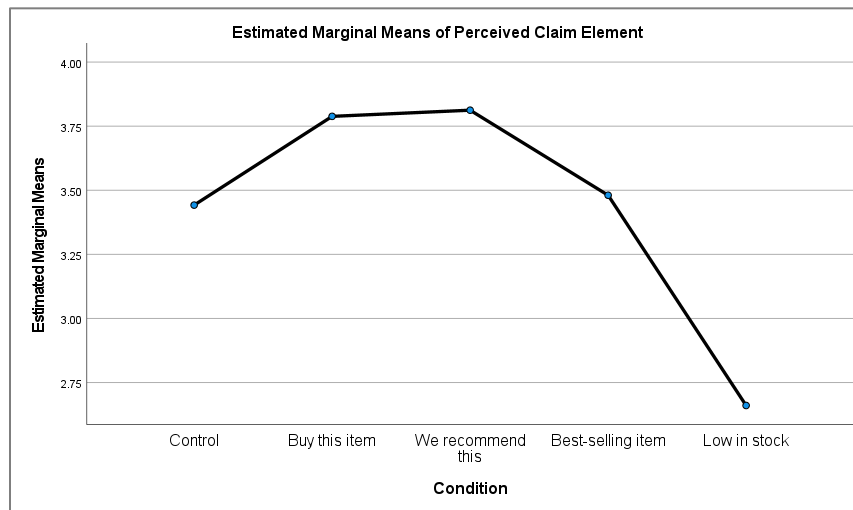
Figure 60. The difference in perceived claim content in the suggestive content pretest 3

Manipulation check on perceived data element. As Cronbach's alpha of the three scale items was 0.48, much lower than 0.7 (see Table 123), these results should be interpreted cautiously. In addition to perceived informative design, I utilized perceived data content as a measure of data manipulation. The means and standard deviations are reported in Table 128. Results from a one-way ANOVA indicated that there was no significant difference in perceived data element, $F(4, 125) = 0.84$, $p = .50$, $\eta_p^2 = .03$ with a small effect size. Thus, the manipulation of data content was

not successful based on this analysis. The difference in perceived data content among all conditions is featured in Figure 61.

Suggestive Content PDF	Mean	Standard Deviation
Control	5.03	1.30
Buy this item	4.73	1.33
We recommend this	5.06	0.97
Best-selling item	5.29	1.02
Low in stock	4.88	1.18

Table 128. Means and standard deviations of perceived data element in the suggestive content pretest 3
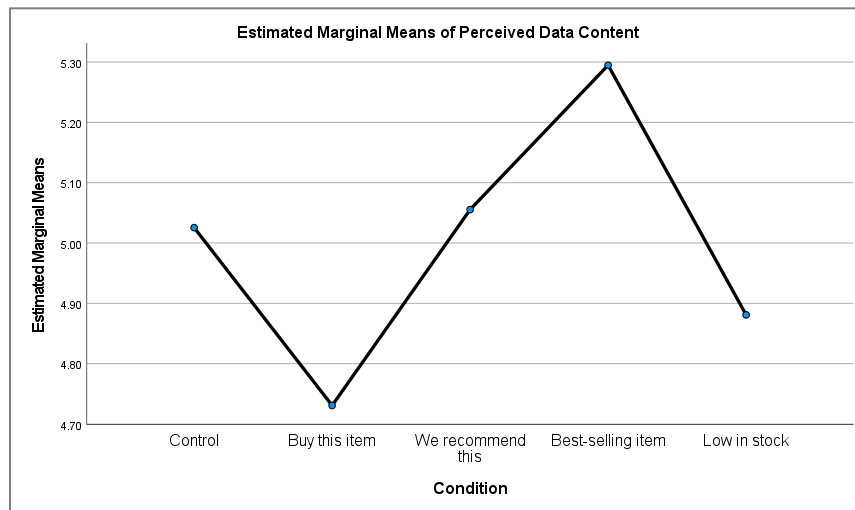
Figure 61. The difference in perceived data element in the suggestive content pretest 3

Results on perceived persuasive intent. The means and standard deviations present in Table 129. Results from a one-way ANOVA revealed that a significant effect of suggestive content was found, $F(4, 125) = 5.86$, $p < .001$, $\eta_p^2 = .16$ with a large effect size. Follow-up tests using a Bonferroni correction was run. Results showed that "buy this item" caused a significantly higher perceived persuasive intent than the control condition, $p = .05$, and "we recommend this" led to a significantly higher perceived persuasive intent than the control $p < .001$, and "low in stock," $p = .01$. Consequently, the suggestive PDFs featuring claim content, "buy this item" and "we

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recommend this," resulted in higher perceived persuasive intent than the suggestive PDF featuring "low in stock" and no suggestive PDF. See the difference in perceived persuasive intent across all conditions in Figure 62.

Suggestive Content PDF	Mean	Standard Deviation
Control	2.10	1.30
Buy this item	3.23	1.58
We recommend this	3.92	1.42
Best-selling item	2.91	1.21
Low in stock	2.60	1.51

Table 129. Means and standard deviations of perceived persuasive intent in the suggestive content pretest 3
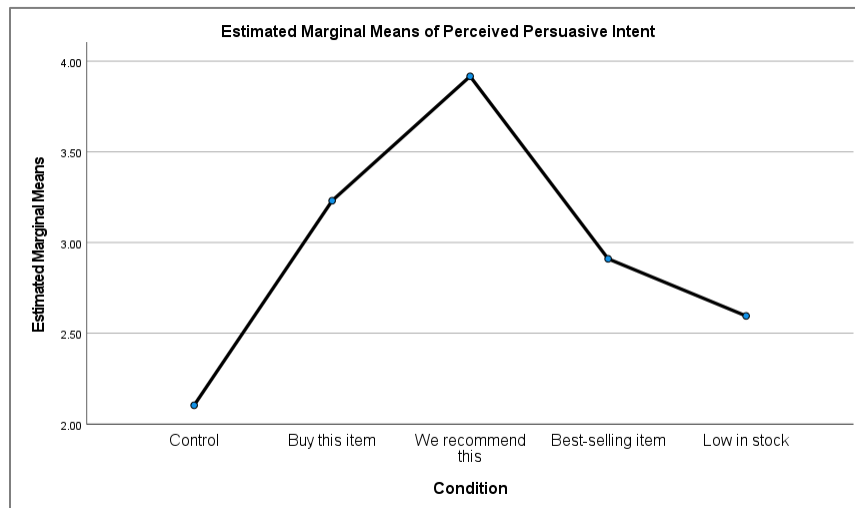
Figure 62. The effect of suggestive content on perceived persuasive intent 3

Results on perceived assistive intent. The means and standard deviations are shown in Table 130. Results from a one-way ANOVA indicated that there was a no significant effect of suggestive content, $F(4, 125) = 0.84$, $p = .50$, $\eta_p^2 = .03$ with a small effect size. Thus, inconsistent with my expectation, the suggestive content PDF did not lead to perceived assistive intent. See the difference in perceived assistive intent across all conditions in Figure 63.

Suggestive Content PDF	Mean	Standard Deviation
Control	4.59	1.69
Buy this item	4.58	1.24
We recommend this	4.86	1.31
Best-selling item	4.54	1.38
Low in stock	4.13	1.63

Table 130. Means and standard deviations of perceived assistive intent in the suggestive content pretest 3
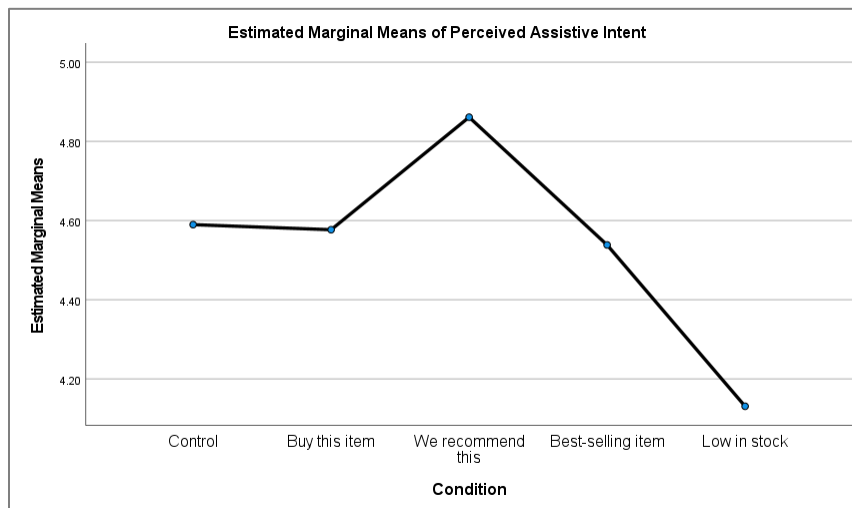
Figure 63. The effect of suggestive content on perceived assistive intent in the suggestive content pretest 3

Results on targeted product compared. Numbers and percentages of a targeted product compared are reported in Table 131. Results from a Chi-square test revealed that there was a significant association between the suggestive content and the number of a targeted product compared, $\chi^2(4) = 15.15$, p < .001, $\varphi_c = .40$, with a very strong association. Z-tests using a Bonferroni correction were conducted. Results showed that the percentage of those in the "we recommend this" condition who compared a targeted product was significantly different from that of those in the control condition, $p < .05$. Also, results indicated that the percentage of those in the "best-selling item" condition significantly differed from that of those in the control condition, $p <$ .05. Therefore, a website featuring "we recommend this" and "best-selling item" drove participants

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to consider a targeted item more than a website without suggestive content. The targeted product

not compared to targeted product compared proportions are depicted in Figure 64.

Suggestive Content PDF	Targeted Product Not Compared (N)	Targeted Product Not Compared (%)	Targeted Product Compared (N)	Targeted Product Compared (%)
Control	17	100.00	0	0.00
Buy this item	12	70.59	5	29.41
We recommend this	7	41.18	10	58.82
Best-selling item	14	60.87	9	39.13
Low in stock	16	76.19	5	23.81

Table 131. Numbers and percentages of a targeted product compared in the suggestive content pretest 3
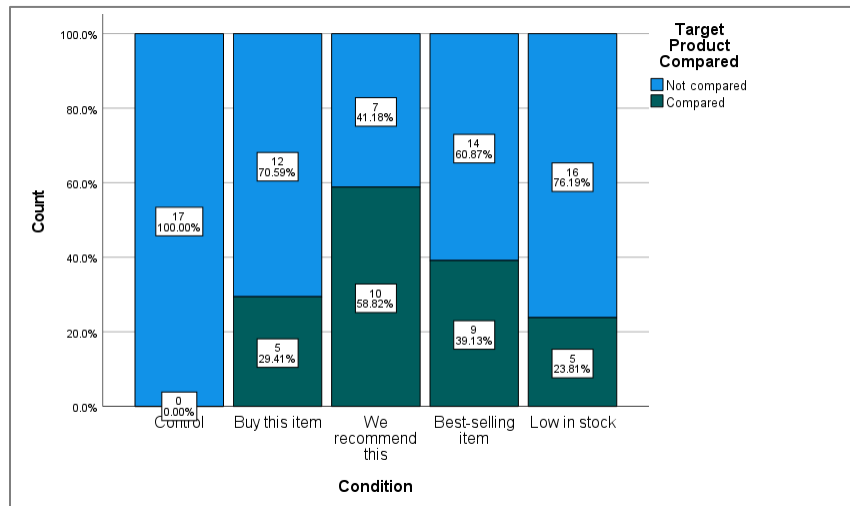
Figure 64. The targeted product not compared to targeted product compared proportions in the suggestive content pretest 3

Results on targeted product viewed. Numbers and percentages of a targeted product compared

present in Table 132. Results from a Chi-square test demonstrated that a significant association

between the suggestive content and the number of a targeted product viewed was found, $\chi^2(4) =$

12.89, $p = .01$, $\varphi_c = .37$, with a very strong association. Z-tests using a Bonferroni correction were

followed. Results showed that the percentage of those in the "buy this item" condition who viewed

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a targeted product was significantly different from that of those in the control condition, $p < .05$. Also, results suggested that the percentage of those in the "we recommend this" condition significantly differed from that of those in the control condition, $p < .05$. Consequently, a website featuring "buy this item" and "we recommend this" made participants view a targeted item more than a website without suggestive content. The targeted product not viewed to targeted product viewed proportions are shown in Figure 65.

Suggestive Content PDF	Targeted Product Not Viewed (N)	Targeted Product Not Viewed (%)	Targeted Product Viewed (N)	Targeted Product Viewed (%)
Control	17	100.00	0	0.00
Buy this item	10	58.82	7	41.18
We recommend this	9	52.94	8	47.06
Best-selling item	18	78.26	5	21.14
Low in stock	17	80.95	4	19.05

Table 132. Numbers and percentages of a targeted product viewed in the suggestive content pretest 3
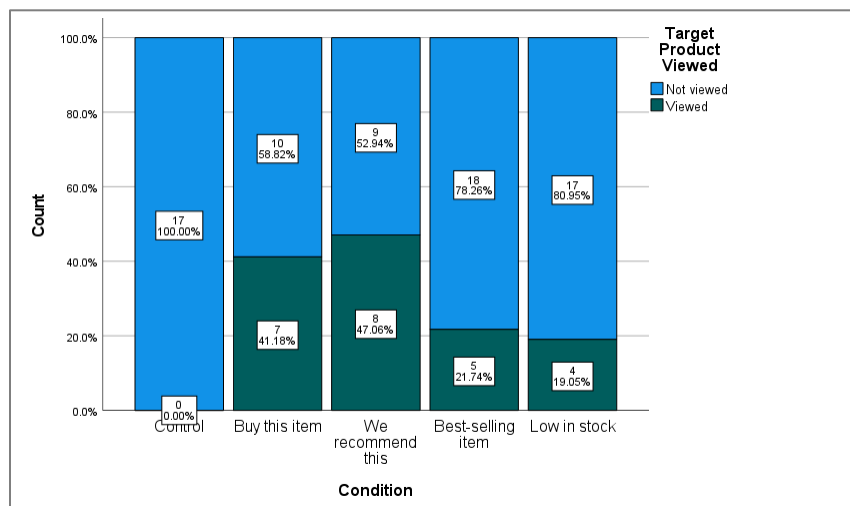
Figure 65. The targeted product not viewed to targeted product viewed proportions in the suggestive content pretest 3

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Results on targeted product chosen. Numbers and percentages of a targeted product compared are reported in Table 133. Results from a Chi-square test revealed that there was no significant association between the suggestive content and the number of a targeted product chosen, $\chi^2(4) = 3.96$, $p = .41$, $\varphi_c = .18$, with a weak association. Hence, the suggestive content feature did not influence participants to select a targeted product. The targeted product not chosen to targeted product chosen proportions appear in Figure 66.

Suggestive Content PDF	Targeted Product Not Chosen (N)	Targeted Product Not Chosen (%)	Targeted Product Chosen (N)	Targeted Product Chosen (%)
Control	25	96.15	1	3.85
Buy this item	24	92.31	2	7.69
We recommend this	21	87.50	3	12.50
Best-selling item	24	92.31	2	7.69
Low in stock	28	100.00	0	0.00

Table 133. Numbers and percentages of a targeted product chosen in the suggestive content pretest 3
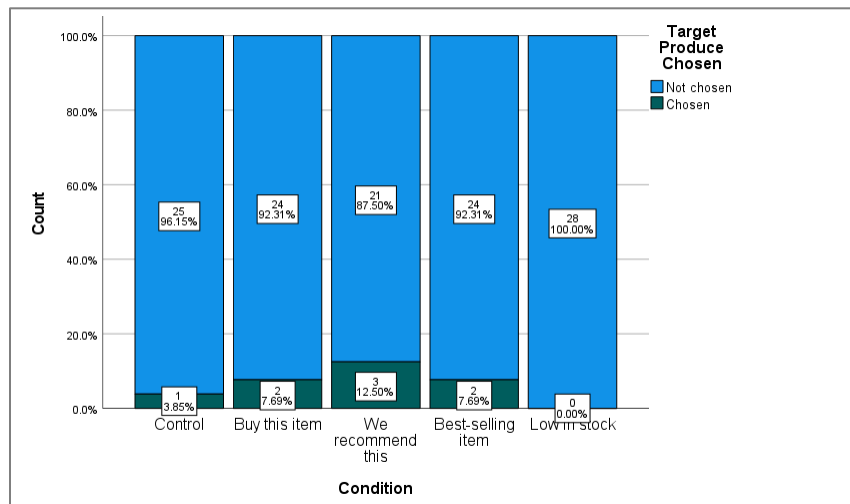
Figure 66. The targeted product not compared to targeted product chosen proportions in the suggestive content pretest 3

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Results on the number of products compared. The means and standard deviations are reported in Table 134. Results from a one-way ANOVA indicated that there was no significant difference in perceived data element, $F(4, 90) = 0.36$, $p = .84$, $\eta_p^2 = .02$ with a small effect size. Thus, the suggestive content did not affect the number of products participants compared. The difference in the number of products compared among all conditions is featured in Figure 67.

Suggestive Content PDF	Mean	Standard Deviation
Control	5.82	2.86
Buy this item	6.94	9.73
We recommend this	4.65	2.89
Best-selling item	5.30	5.43
Low in stock	5.00	7.31

Table 134. Means and standard deviations of the number of products compared in the suggestive content pretest 3
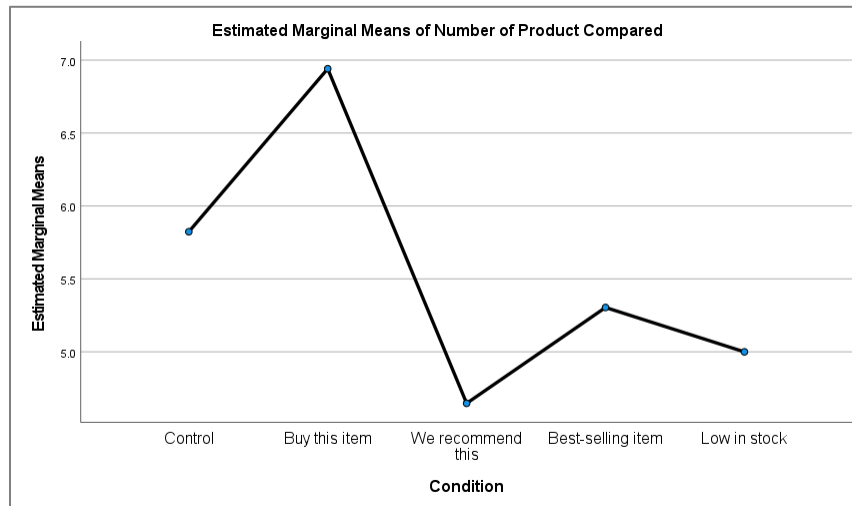
Figure 67. The difference in the number of products compared in the suggestive content pretest 3

Results on the number of products viewed. The means and standard deviations are reported in Table 135. Results from a one-way ANOVA indicated that there was no significant difference in perceived data element, $F(4, 90) = 0.68$, $p = .61$, $\eta_p^2 = .03$ with a small effect size. Accordingly,

the suggestive content did not drive the number of products participants viewed. The difference in the number of products viewed among all conditions is depicted in Figure 68.

Suggestive Content PDF	Mean	Standard Deviation
Control	2.41	2.83
Buy this item	3.18	2.90
We recommend this	1.88	1.80
Best-selling item	3.13	3.78
Low in stock	3.86	6.30

Table 135. Means and standard deviations of the number of products viewed in the suggestive content pretest 3
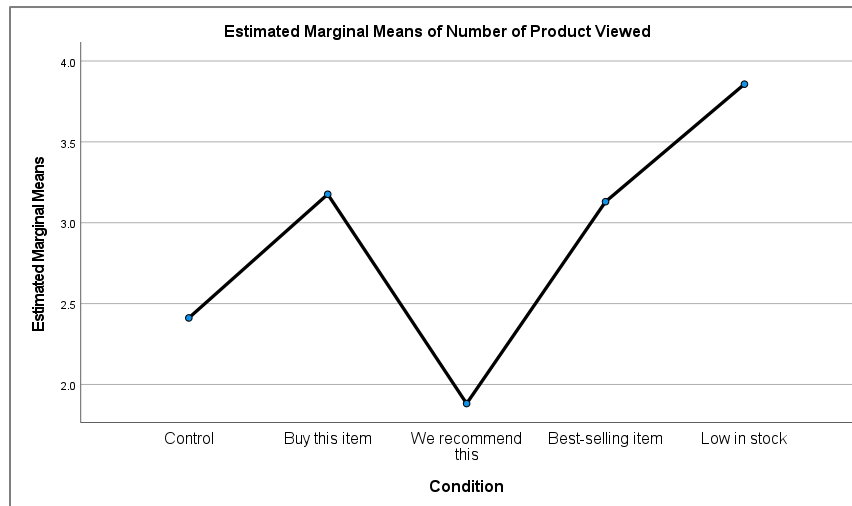
Figure 68. The difference in the number of products viewed in the suggestive content pretest 3

Measurement model of structural path. SmartPLS 3 was used to evaluate the relationship among perceived persuasive intent, perceived assistive intent, perceived appropriateness, and reactance (anger). According to Barclay et al. (1995), the measurement model was examined in terms of internal consistency reliability and discriminant validity. All items tapped on their respective latent variables, with loadings greater than 0.70 (see Table 136). The internal consistency reliability was evident by the composite reliability and Cronbach's alpha greater than or equal to 0.70 (see Table 137). The square root of AVE of each latent variable was greater than

correlations between itself and others (see Table 137). Also, there was no loading higher than the loadings of the respective latent variables (see Table 136). In sum, these supported acceptable discriminant validity.

	Perceived Appropriateness	Perceived Assistive Intent	Perceived Persuasive Intent	Reactance (Anger)
Anger1	-0.49	-0.43	0.13	**0.87**
Anger2	-0.63	-0.50	0.17	**0.94**
Anger3	-0.60	-0.53	0.14	**0.97**
Anger4	-0.55	-0.48	0.16	**0.94**
Appropriate1	**0.90**	0.48	-0.16	-0.59
Appropriate2	**0.85**	0.40	-0.15	-0.51
Appropriate3	**0.73**	0.24	-0.33	-0.40
Assist1	0.48	**0.93**	0.16	-0.52
Assist2	0.36	**0.92**	0.15	-0.41
Assist3	0.41	**0.89**	0.13	-0.48
Persuasive1	-0.28	0.05	**0.92**	0.18
Persuasive2	-0.12	0.30	**0.83**	0.04
Persuasive3	-0.14	0.18	**0.75**	0.13

Table 136. Loadings and cross loadings in the suggestive content pretest 3

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)	Perceived Appropriateness	Perceived Assistive Intent	Perceived Persuasive Intent	Reactance - Anger
Perceived Appropriateness	0.77	0.87	0.69	0.83			
Perceived Assistive Intent	0.90	0.94	0.83	0.46	0.91		
Perceived Persuasive Intent	0.80	0.87	0.70	-0.24	0.16	0.84	
Reactance - Anger	0.95	0.96	0.87	-0.61	-0.52	0.16	0.93

Note: Off-diagonal – correlations, diagonal – the square root of AVE

Table 137. Internal consistency and discriminant validity in the suggestive content pretest 3

Structural path analysis. The path significance of the structural path model was assessed using bootstrap resampling. Results showed that perceived persuasive intent was significantly and negatively related to perceived appropriateness, $t = 3.82$, $p < .001$, while perceived assistive intent was significantly and positively associated with perceived appropriateness, $t = 7.68$, $p < .001$, $R^2 = 0.32$. That is, perceived persuasive intent had a negative impact on perceived appropriateness, while perceived assistive intent had a positive effect on perceived appropriateness. Perceived appropriateness was found to have a significant and negative effect on reactance (anger), $t = 8.54$, $p < .001$, $R^2 = 0.38$. Thus, perceived appropriateness reduced reactance (anger). The overall

constructs explained 38% of the variances in reactance (anger). The structural path model is depicted in Figure 69.
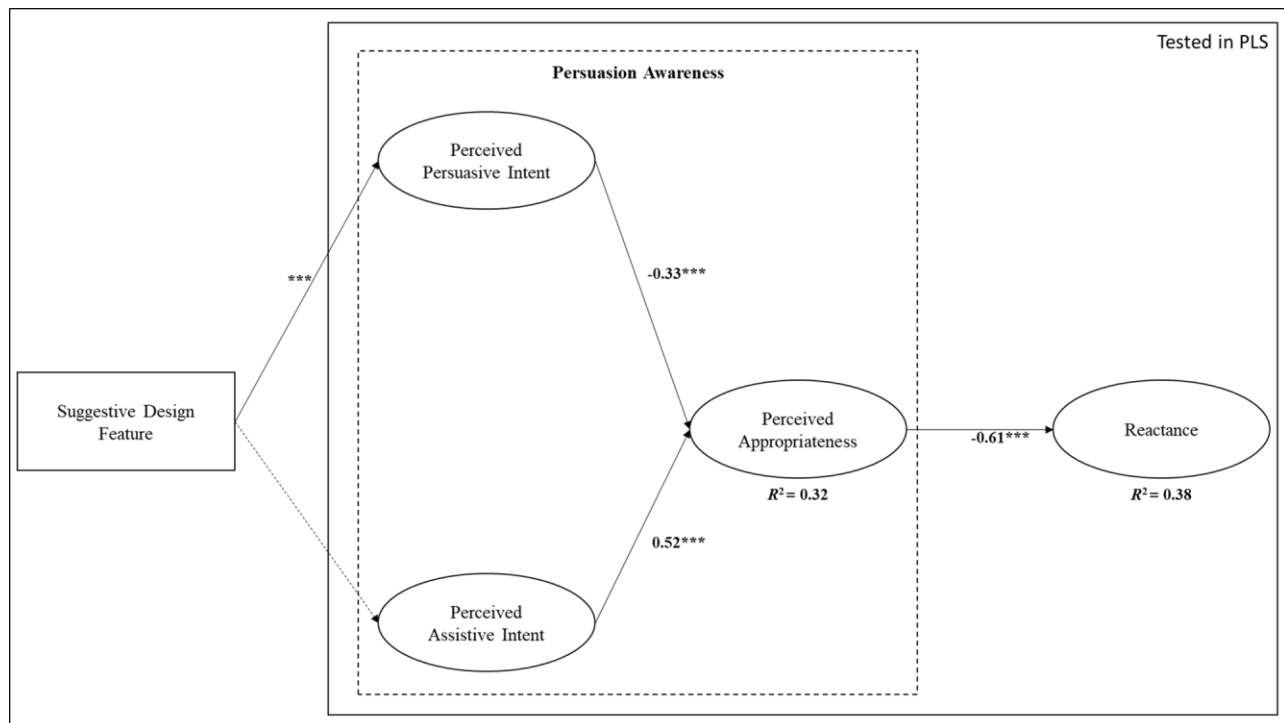
Note: Significant at the level .1, ** significant at level .05, ***significant at level .001, dotted line – non-significant path

Figure 69. Structural path model in the suggestive content pretest 3

Conclusion. This pretest supported that the suggestive content had a positive impact on perceived persuasive intent, while did not influence perceived assistive intent. On the one hand, perceived persuasive intent negatively influenced perceived appropriateness. On the other hand, perceived assistive intent positively affected perceived appropriateness. Perceived appropriateness, in turn, decreased reactance (anger). In addition, the suggestive content PDF influenced whether a targeted product was compared and viewed. That is, a website with "buy this item," "we recommend this," and "best-selling item" drove these behaviors more than a website without suggestive content. Table 138 presents perceived assistive and persuasive intent in each condition. Figure 70 shows the differences in perceived assistive and persuasive intent across all conditions. According to this

pretest, the suggestive design content influenced participants' perceptions and behaviors to some extent. In general, they perceived higher assistive intent than perceived persuasive intent. In other words, those who were exposed to the suggestive content PDF were less likely to be aware of a persuasion attempt triggered by the PDF, compared to its assistive intent. That is, they were influenced without their awareness of being persuaded. This replicates the pattern of results in the previous pretests.

Perceived Assistive Intent	Perceived Persuasive Intent	
	Low	High
Moderate	Control [4.59, 2.10]	
	Low in stock (data) [4.13, 2.60]	Buy this item (claim) [4.58, 3.23]
	Best-selling item (data) [4.54, 2.91]	We recommend this (claim) [4.86, 3.92]

Note: [mean of perceived assistive intent, mean of perceived persuasive intent]

Table 138. Perceived assistive and persuasive intent in the suggestive content pretest 3

Perceived Assistive - Persuasive Intent

- Control: Assistive 4.59, Persuasive 2.10
- Buy this item: Assistive 4.58, Persuasive 3.23
- We recommend this: Assistive 4.86, Persuasive 3.92
- Best-selling item: Assistive 4.54, Persuasive 2.91
- Low in stock: Assistive 4.13, Persuasive 2.60

Legend: Assistive, Persuasive
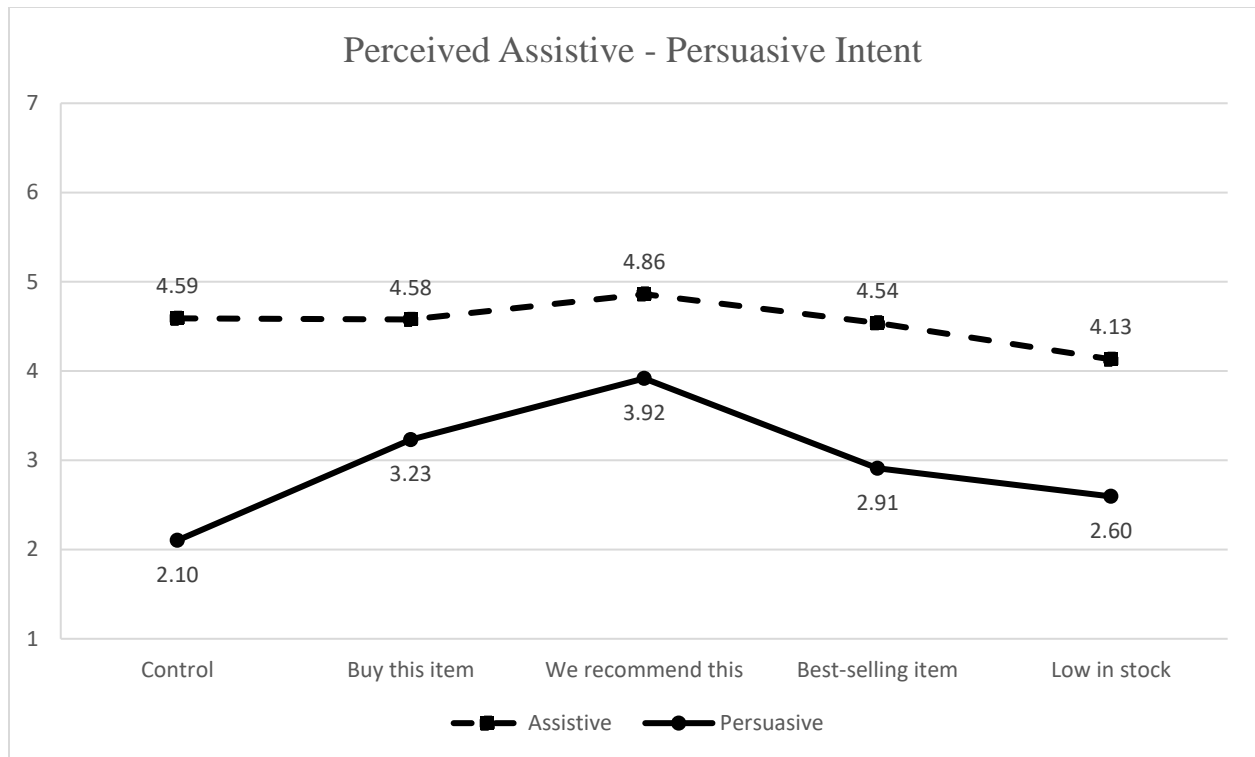
Figure 70. Differences in perceived assistive and persuasive intent in the suggestive content pretest 3

Appendix F Participants in Empirical Study 1

Criteria	Group	Control	Buy this item	We recommend this	Best-selling item	Low in stock	Best-selling item. We recommend this.	Since this is best-selling, we recommend this.	Total	df	$\chi 2$	*p*
Finished	Not finished	1	1	0	0	0	0	0	2	6	4.01	0.68
	Finished	93	83	77	87	78	75	37	530			
Wrong username	Correct username	83	84	76	87	78	74	37	519	N/A	N/A	N/A
	Wrong username	N/Aᵃ	N/Aᵃ	N/Aᵃ	N/Aᵃ	N/Aᵃ	N/Aᵃ	N/Aᵃ	13			
Finished and correct username												
Order more than one item	One item	76	81	74	84	75	70	34	494	6	5.83	0.44
	More than one item	7	2	2	3	3	4	3	24			

Criteria	Group	Control	Buy this item	We recommend this	Best-selling item	Low in stock	Best-selling item. We recommend this.	Since this is best-selling, we recommend this.	Total	df	$\chi2$	p
Website time >= 60 sec	Failed	1	0	0	0	0	0	0	1	6	5.25	0.51
	Passed	82	83	76	87	78	74	37	517			
Mobile device	Desktop	81	80	75	87	76	73	37	509	6	4.58	0.60
	Mobile	2	3	1	0	2	1	0	9			
Attention checks	Failed	5	2	2	6	4	2	3	24	6	4.67	0.59
	Passed	78	81	74	81	74	72	34	494			
GA track	No track	17	15	11	19	23	19	11	115	6	7.72	0.26
	Track	66	68	65	68	55	55	26	403			
Total	N	94	84	77	87	78	75	37	532			
Total finished	N	83	83	76	87	78	74	37	518			

Criteria	Group	Control	Buy this item	We recommend this	Best-selling item	Low in stock	Best-selling item. We recommend this.	Since this is best-selling, we recommend this.	Total	df	χ^2	p
and correct username												
Total usable sample	N	71	76	71	78	70	67	31	464	6	4.41	0.62
Experiment 1 usable sample	N	38	37	36	40	38	35	N/A	224	5	3.27	0.66
Experiment 2 usable sample	N	33	39	35	38	32	32	31	240	6	5.61	0.47
Total usable sample with GA	N	55	62	60	59	48	49	22	355	6	8.87	0.18

Criteria	Group	Control	Buy this item	We recommend this	Best-selling item	Low in stock	Best-selling item. We recommend this.	Since this is best-selling, we recommend this.	Total	df	$\chi2$	p
Experiment 1 usable sample with GA	N	28	31	32	32	28	26	N/A	177	5	0.74	0.19
Experiment 2 usable sample with GA	N	27	31	28	27	20	23	22	178	6	3.86	0.70

Note: [a] – participants who used the wrong username were removed from the analysis, as their pre- and post-questionnaire survey, as well as experimental condition, could not be tracked.

Table 139. Participants in empirical study 1 (experiment 1 and 2)

Appendix G Scenario in Empirical Study 1

Assume that you are going to buy a new digital bathroom scale for yourself. You want to buy it on the Internet. After your evaluation of all available online websites, you have found **homeappliancegroup.com**, which provides a wide selection of scales.

As a result, assume you are now entering homeappliancegroup.com to buy a scale. You are exploring the scale models on the website. You can spend as much time as you like on the website to evaluate models and identify one model you seriously consider purchasing for yourself.

Once you choose the scale you would seriously consider purchasing for yourself, you will be asked to answer questions regarding how you used the website, your purchasing decision, and how you felt about the website design.

Please note that there are no right or wrong answers here, we are just interested in getting an honest and detailed description of your behavior and perception towards homeappliancegroup.com.

Figure 71. Scenario in empirical study 1

Appendix H Tutorial in Empirical Study 1

To show how our website works, we will use the Wireless Headphones page.

On the shop page, you will be presented with 40 product choices.

- You can click on each product picture, product name, or "View product" to see more information about the product.

- The website allows you to compare up to 6 products at a time. To compare products, click on "Compare product" button of product you are interested in and then click on "View compare". You can click on "X" to remove a product or "Clear all" to remove all products from comparison.

After clicking **"View product"**, you will be directed to the product detail page.

JBuds Pro Signature

$19.99

| 1 | Add to cart |

➡ Click "**Add to cart**" to add a product to your cart.

Compare product

➡ Click "**Compare product**" to add a product to comparison.

Additional information >

Additional information

Brand	JLab Audio
Headphone fit	In-ear
Sound isolating	Yes
Water resistant	Yes
Battery life (hours)	6
Battery charge time (hours)	5
Weight (grams)	16
Warranty terms (months)	24

Home Appliance Group
Browse a wide selection of products

Login   Shop Wireless Headphones $0.00   0 items   🛒

Shop Wireless Headphones

JBuds Pro Signature	Sony WI-C300	Insignia NS-CAHBTEBNC-S	Sony C400
$19.99	$49.99	$79.99	$69.99
View product	View product	View product	View product
View compare	View compare	View compare	Compare product

Click "**View compare**" to see the product comparison.

After clicking "**View compare**", you will be directed to the Compare Products page.

Compare Products

Click "**CLEAR ALL**" to clear all products from comparison.

Click "**X REMOVE**" to remove a product from comparison.

Click "**ADD TO CART**" to add a product to your cart.

Click "**ADD TO CART**" to add a product to your cart.

You can spend as much time as you like to evaluate product choices. Participants who seriously do the task will be eligible for an additional bonus.

Once you select one product you would seriously consider purchasing, click "Add to cart" and then "Place order".

- If you want to edit your cart, click on the basket icon on the top right.

If you want to remove the product from your cart, click the "**basket**" icon.

Once clicking "Place order", you will be redirected to the post-questionnaire survey.

Figure 72 A Tutorial in empirical study 1

Appendix I Pre- and Post-Questionnaire Survey in Empirical Study 1

Construct	Item Name	Item	Scale	Source(s)
Pre-questionnaire survey				
Demographics				
Age	Age	What is your age?	Under 18 years	
			18 - 24 years	
			25 - 34 years	
			35 - 44 years	
			45 - 54 years	
			55 - 64 years	
			65 years or older	
Education	Edu	What is your education level?	Completed some high school	
			High school graduate	
			Completed some college	
			Associate degree	
			Bachelor's degree	
			Master's degree	
			Professional degree	
			Doctoral degree	

Construct	Item Name	Item	Scale	Source(s)
Marital status	Marital	What is your marital status?	Single (never married)	
			Married	
			Separated	
			Widowed	
			Divorced	
Gender	Gender	What is your gender?	Female	
			Male	
Income	Income	What was your income before taxes during the past 12 months?	Less than $25,000	
			$25,000 - $34,999	
			$35,000 - $49,999	
			$50,000 - $74,999	
			$75,000 - $99,999	
			$100,000 - $149,999	
			$150,000 - $199,999	
			$200,000 or more	
Initial product preferences		In this study, you will be asked to select one digital bathroom scale you would seriously consider purchasing and		

Construct	Item Name	Item	Scale	Source(s)
		evaluate the design of a website. Indicate your scale preferences for each attribute.		
Price preference	Price_Pref	Select your preferred price	Less than 20.00	
			20.00 - 30.99	
			40.00 - 59.99	
			60.00 - 79.99	
			80.00 and more	
Brand preference	Brand_Pref	Select your preferred brand	American Weigh Scales	
			Bally	
			Conair	
			EatSmart	
			Nokia	
			Omron	
			PyleHealth	
			Taylor	
			Vivitar	
Maximum weight capacity (lb) preference	Max_Pref	Select your preferred maximum weight capacity	Less than 300	
			300 -349	
			350 - 399	
			400 - 449	
			450 - 499	
			500 and more	
BMI measure preference	BMI_Pref	Select your preferred BMI measure	yes	
			no	

Construct	Item Name	Item	Scale	Source(s)
Body fat percentage measure preference	BFP_Pref	Select your preferred body fat percentage measure	yes no	
Linear dimension (in) preference	Dim_Pref	Select your preferred linear dimension (in)	Less than 25.0 25.0 -26.9 27.0 - 28.9 29.0 - 30.9 31.0 and more	
Weight (lb) preference	Weight_Pref	Select your preferred weight (lb)	Less than 2.0 2.0 - 3.9 4.0 - 5.9 6.0 and more	
Display size (in) preference	Dis_Pref	Select your preferred display size (in)	Less than 2.0 2.0 - 2.9 3.0 - 3.9 4.0 and more	
Warranty terms (months) preference	Warr_Pref	Select your preferred warranty terms (months)	0 12 18 24	
Attribute importance ranking		Please rank the following digital bathroom scale attributes in order of the importance to your product decision. Place the most important attribute at the top and the least important attribute at the bottom (1 = the most	1 = the most important to 9 = the least important	

Construct	Item Name	Item	Scale	Source(s)
		important to 9 = the least important). Note: Random ordering of attribute choices		
	Price_Rank	Price ($)		
	Brand_Rank	Brand		
	Max_Rank	Maximum weight capacity (lb)		
	BMI_Rank	BMI measure		
	BFP_Rank	Body fat percentage measure		
	Dim_Rank	Linear dimension (in)		
	Weight_Rank	Weight (lb)		
	Dis_Rank	Display size (in)		
	Warr_Rank	Warranty terms (months)		
Post-questionnaire survey				
Behavioral responses				
Reactance – negative cognition	Cognition	List all thoughts that came to your mind when interacting with [agent name].	Open-ended	Dillard and Shen (2005)
Manipulation checks				
		Please evaluate [agent name] in the following aspects:	Seven-point semantic differential scale	
Suggestive design	Suggest1	... did not make a recommendation. – ... made an explicit recommendation.		Al-Natour et al. (2006)

Construct	Item Name	Item	Scale	Source(s)
	Suggest2	... did not provide a suggestion in terms of what option to select. – ... provided an explicit suggestion in terms of what option to select.		Al-Natour et al. (2006)
	Suggest3_R	... explicitly suggested a specific course of action. – ... did not suggest a specific course of action. (R)		Al-Natour et al. (2006)
Informative design	Info1	... did not provide useful information. – ... provided useful information.		Newly developed
	Info2	... was uninformative. – ... was informative.		Newly developed
	Info3_R	... provided relevant information. – ... did not provide relevant information. (R)		Newly developed
Claim	Claim1	... did not state a conclusion put forward for acceptance. – ... stated a conclusion put forward for acceptance.		Newly developed
	Claim2	... did not make an assertion. – ... made an assertion.		Newly developed
	Claim3_R	... made a claim. – ... did not make a claim. (R)		Newly developed
Data	Data1	... did not give the factual data. – ... gave the factual data.		Newly developed
	Data2	... did not provide an evidence. – ... provided an evidence.		Newly developed

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Construct	Item Name	Item	Scale	Source(s)
	Data3_R	... offered supporting information. – ... did not offer supporting information. (R)		Newly developed
Attention check	AC1	Please select '2' for this statement. – Please select '2' for this statement		
Outcome variables				
		To what extent do you agree or disagree with the following statements with respect to [agent name]:	1 = strongly disagree to 7 = strongly agree	
Perceived personalization	Person1	... understood my needs.		Komiak and Benbasat (2006)
	Person2	... took my needs as its own preferences.		Komiak and Benbasat (2006)
	Person3_R	... did not know what I want. (R)		Komiak and Benbasat (2006)
Persuasion awareness		To what extent do you agree or disagree with the following statements with respect to [agent name]:		
Perceived assistance				

Construct	Item Name	Item	Scale	Source(s)
Perceived assistive intent	Assist1	I feel ... was trying to help me.		Newly developed
	Assist2	I perceive ... was trying to assist me.		Newly developed
	Assist3_R	I do not feel ... attempted to help me. (R)		Newly developed
Perceived user benefits	UBenefit1	I feel I benefited from interacting with		Campbell (1995)
	UBenefit2	I perceive I got benefits from interacting with		Campbell (1995)
	UBenefit3_R	I did not get any information from interacting with ... . (R)		Campbell (1995)
Perceived persuasion				
Perceived persuasive intent	Persuasive1	... tried to make me act in a certain way.		Al-Natour et al. (2006)
	Persuasive2	... tried to direct my decision.		Al-Natour et al. (2006)
	Persuasive3_R	... did not try to influence me to perform a certain action. (R)		Newly developed
Perceived agent (website) benefits	WBenefit_S1	... had a direct profit motive.		Williams et al. (2004)
	WBenefit_S2	... tried to make a sale of a certain product.		Newly developed
	WBenefit_S3_R	I do not think the goal of ... was to sell a specific product. (R)		Newly developed

Construct	Item Name	Item	Scale	Source(s)
Perceived user costs	UCost_E1	I put a lot of effort into interacting with		Tsekouras et al. (Working Paper)
	UCost_E2	I worked hard interacting with		Tsekouras et al. (Working Paper)
	UCost_E3_R	I did not exert a lot of effort into interacting with ... . (R)		Tsekouras et al. (Working Paper)
Perceived agent (website) costs	WCost1	... seems to have put more effort into its design features.		Campbell (1995)
	WCost2	... seems to have put a lot of time into its design features.		Campbell (1995)
	WCost3_R	... did not show a lot of thought and care in its design features. (R)		Campbell (1995)
Perceived appropriateness	Appropriate1	The way ... designed its design features seems acceptable to me.		Campbell (1995)
	Appropriate2	I think that the design features of ... are appropriate.		Campbell (1995)
	Appropriate3_R	The design features of ... are not fair in what were shown. (R)		Campbell (1995)
Attention check	AC2	For this statement, please choose 'strongly disagree.'		
Cognitive – behavioral responses				

Construct	Item Name	Item	Scale	Source(s)
		Answer the following questions with respect to [agent name]:	1 = none to 7 = a great deal	
Reactance - anger	Anger1	Did you feel angry while interacting with … ?		Dillard and Shen (2005)
	Anger2	Did you feel annoyed while interacting with … ?		Dillard and Shen (2005)
	Anger3	Did you feel irritated while interacting with … ?		Dillard and Shen (2005)
	Anger4	Did you feel aggravated while interacting with … ?		Dillard and Shen (2005)
Attention check	AC3	Select '4' for this statement.		
		To what extent did you feel the design of [agent name] was:	Seven-point semantic differential scale	
Attitudes towards an agent (website)	Att1	Bad – Good		Newly developed
	Att2	Unfavorable – Favorable		Newly developed
	Att3_R	Likable – Dislikable (R)		Newly developed
		To what extent do you agree or disagree with the following statements with respect to [agent name]:	1 = strongly disagree to 7 = strongly agree	

Construct	Item Name	Item	Scale	Source(s)
Intention to use an agent	Inten1	I intend to use ... in the future.		Pavlou and Fygenson (2006)
	Inten2	I predict I would use ... in the future.		Pavlou and Fygenson (2006)
	Inten3_R	I do not plan to use ... in the future. (R)		Pavlou and Fygenson (2006)
Attention check	AC4	Select 'disagree' for this statement.		
Control variables				
		To what extent do you agree or disagree with the following statements:	1 = strongly disagree to 7 = strongly agree	
Agent (domain) knowledge	AgentKnow1	I have extensive experience with e-commerce websites.		Al-Natour et al. (2011)
	AgentKnow2	I consider myself to be an expert in e-commerce websites.		Al-Natour et al. (2011)
	AgentKnow3_R	I have no idea about e-commerce websites. (R)		Al-Natour et al. (2011)

Construct	Item Name	Item	Scale	Source(s)
Topic knowledge	TopicKnow 1	I consider myself to be an expert in bathroom scales.		Al-Natour et al. (2011)
	TopicKnow 2	I am knowledgeable about bathroom scales.		Al-Natour et al. (2011)
	TopicKnow 3_R	I have limited experience in bathroom scales. (R)		Al-Natour et al. (2011)
Persuasion knowledge	PerKnow1	I know when an offer is too good to be true.		Bearden et al. (2001)
	PerKnow2	I know when a marketer is pressuring me to buy.		Bearden et al. (2001)
	PerKnow3_ R	I cannot see through sales gimmick used to get consumers to buy. (R)		Bearden et al. (2001)
Attention check	AC5	Select 'somewhat disagree' for this statement.		
Perceived usefulness	Useful1	Using the website enabled me to accomplish my shopping task more quickly.		Davis et al. (1989)
	Useful2	Using the website made it easier to do my shopping task.		Davis et al. (1989)
	Useful3_R	I found the website not useful in my shopping task.		Davis et al. (1989)
Perceived ease of use	Ease1	I found it easy to get the website to do what I wanted it to do.		Davis et al. (1989)

Construct	Item Name	Item	Scale	Source(s)
	Ease2	I found the website to be flexible to interact with.		Davis et al. (1989)
	Ease3_R	I found the website not easy to use.		Davis et al. (1989)
Attention check	AC6	Select 'neither agree nor disagree' for this statement.		
Online experience	On_Freq	Considering a 7-day period, about how often do you search online?	Less than once a week	
			About once per week	
			About twice per week	
			About three times per week	
			About four times per week	
			About five times per week	
			About six times per week	
			About seven times per week	
			More than seven times a week	
Online shopping experience	Shop_Freq	Considering a month period, about how often do you shop online?	Less than once a month	
			About once per month	

Construct	Item Name	Item	Scale	Source(s)
			About twice per month	
			About three times per month	
			About four times per month	
			About five times per month	
			About six times per month	
			About seven times per month	
			More than seven times a month	
Past bathroom scale purchase	Scale_Exp	Have you ever purchased a bathroom scale before?	Yes	
			No	
		If Scale_Exp = yes,		
	Scale_Exp_ Yes_Dig	Is the bathroom scale you bought digital?	Yes	
			No	
	Scale_Exp_ Yes_When	When did you last purchase the bathroom scale?	Less than a month ago	
			In the last 1 - 3 months	

Construct	Item Name	Item	Scale	Source(s)
			In the last 4 - 6 months	
			In the last 7 - 9 months	
			In the last 10 - 12 months	
			More than 12 months ago	
	Scale_Exp_ Yes_Brand	Which brand did you purchase last time?	Open-ended	
	Scale_Exp_ Yes_Price	How much did you pay for the bathroom scale last time?	Open-ended	
		If Scale_Exp = no,		
	Scale_Exp_ No	When do you intend to purchase a bathroom scale?	Never	
			Less than a month from now	
			In the next 1 - 3 months	
			In the next 4 - 6 months	
			In the next 7 - 9 months	
			In the next 10 - 12 months	
			More than 12 months from now	

Construct	Item Name	Item	Scale	Source(s)
Comments	Comments	Do you have any other comments? Please add any additional questions, comments, concerns, and/or suggestions you may wish to share with us.	Open-ended	

Note: R = reversed item

Table 140. Pre- and post-questionnaire survey in empirical study 1

Appendix J Supplemental Analyses for the Differences among the 7 Conditions in Empirical Study 1

J.1   Manipulation Checks

Perceived claim content. The means and standard deviations are reported in Table 141. Results from a one-way ANOVA pointed out that there was a significant effect of suggestive content, $F(6, 457) = 6.94$, $p < .001$, $\eta_p^2 = .08$ with a medium effect size. Follow-up tests using a Games-Howell correction were conducted. Results revealed that "We recommend this" was marginally significantly perceived as claim content than "Best-selling item," $p = .07$. Also, "Best-selling item. We recommend this." significantly led to a higher level of perceived claim content than the control, $p < .001$, "Buy this item," $p < .001$, "Best-selling item," $p < .001$, and "Low in stock," $p = .02$. Similarly, "Since this is best-selling, we recommend this." significantly resulted in higher perceived claim content than the control, $p < .001$, "Buy this item," $p < .001$, "Best-selling item," $p < .001$, and "Low in stock," $p = .01$. No other significant differences were found, $p > .05$. In particular, claim-only, except "Buy this item," claim-and-data (C & D), and data-supporting-claim (D → C) content stimulated higher perceived claim content. Thus, the manipulation of claim content PDF was successful. Figure 73 depicts the difference in perceived claim content in all seven conditions.

Suggestive Content PDF	Mean	Standard Deviation
Control	3.38	1.58
Buy this item	3.30	1.74
We recommend this	3.98	1.60
Best-selling item	3.21	1.68
Low in stock	3.57	1.57

Suggestive Content PDF	Mean	Standard Deviation
Best-selling item. We recommend this.	4.43	1.42
Since this is best-selling, we recommend this.	4.56	1.09

Table 141. Means and standard deviations of perceived claim content in the seven conditions in empirical study 1
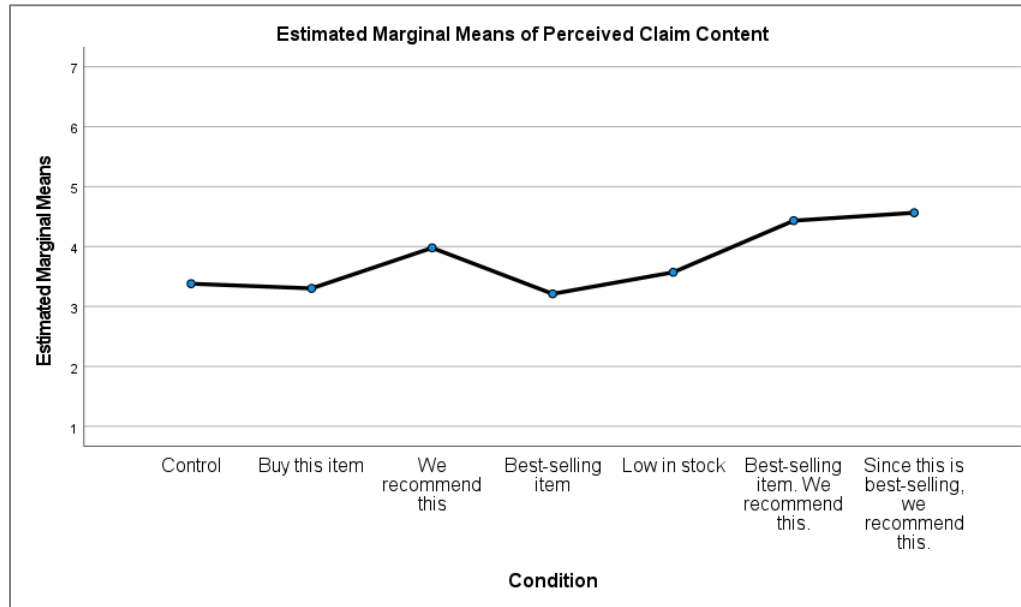
Figure 73. The difference in perceived claim content across the seven conditions in empirical study 1

Perceived informative design. See Table 142 for the means and standard deviations. Results from a one-way ANOVA demonstrated that there was no significant effect of informative design, $F(6, 457) = 1.00$, $p = .43$, $\eta_p^2 = .01$ with a small effect size. That is, perceived informative design did not differ across the conditions. Thus, the manipulation of data content was not successful. The difference in perceived informative design in all seven conditions is shown in Figure 74.

Suggestive Content PDF	Mean	Standard Deviation
Control	5.68	1.35
Buy this item	6.11	0.90
We recommend this	5.92	1.20

Suggestive Content PDF	Mean	Standard Deviation
Best-selling item	6.03	1.35
Low in stock	5.96	1.30
Best-selling item. We recommend this.	6.09	1.00
Since this is best-selling, we recommend this.	5.97	1.31

Table 142. Means and standard deviations of perceived informative design in the seven conditions in empirical study 1
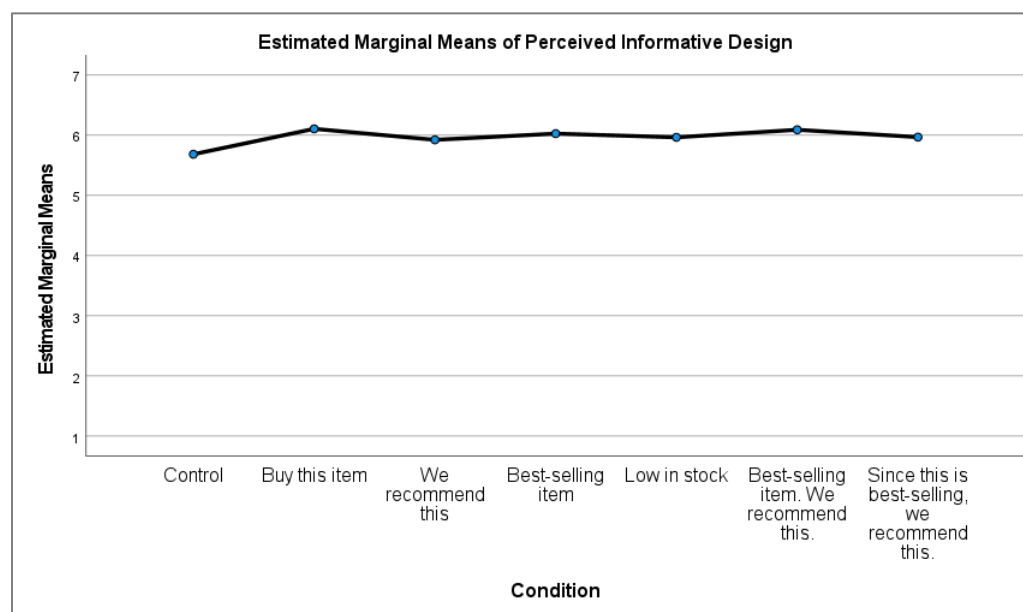
Figure 74. The difference in perceived informative design across the seven conditions in empirical study 1

Perceived suggestive design. The means and standard deviations are presented in Table 143. Results from a one-way ANOVA revealed that there was a significant effect of suggestive content, $F(6, 457) = 14.15$, $p < .001$, $\eta_p^2 = .16$ with a large effect size. Follow-up tests using a Games-Howell correction were conducted. Results showed that "We recommend this" was significantly perceived to be more suggestive than the control, $p < .001$, "Buy this item," $p < .001$, "Best-selling item," $p < .001$, and "Low in stock," $p < .001$. Also, "Best-selling item. We recommend this." significantly led to a higher level of perceived suggestive design than the control, $p < .001$, "Buy

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this item," $p < .001$, "Best-selling item," $p < .001$, and "Low in stock," $p < .001$. In a similar vein, "Since this is best-selling, we recommend this." significantly resulted in higher perceived suggestive design than the control, $p < .001$, "Buy this item," $p < .001$, "Best-selling item," $p < .001$, and "Low in stock," $p < .001$. No other significant differences were found, $p > .05$. That is, claim-only content (C), except "Buy this item," claim-and-data (C & D), and data-supporting-claim (D → C) induced higher perceived suggestive design. Thus, the manipulation of suggestive PDF was generally successful. Figure 75 presents the difference in perceived suggestive design across the seven conditions.

Suggestive Content PDF	Mean	Standard Deviation
Control	3.20	1.47
Buy this item	3.49	1.81
We recommend this	4.76	1.74
Best-selling item	3.55	1.71
Low in stock	3.29	1.42
Best-selling item. We recommend this.	4.80	1.64
Since this is best-selling, we recommend this.	4.97	1.43

Table 143. Means and standard deviations of perceived suggestive design in the seven conditions in empirical study 1

Figure 75. The difference in perceived suggestive design across the seven conditions in empirical study 1

J.2   Results on Perceived Personalization

The means and standard deviations are reported in Table 144. Results from a one-way ANOVA revealed that there was no significant effect of suggestive content, $F(6, 457) = 1.46$, $p = .19$, $\eta_p^2 = .02$ with a small effect size. Thus, the suggestive content manipulation did not influence perceived personalization. Figure 76 presents the difference in perceived personalization across the seven conditions.

Suggestive Content PDF	Mean	Standard Deviation
Control	4.41	1.38
Buy this item	4.27	1.27
We recommend this	4.44	1.44
Best-selling item	4.47	1.29
Low in stock	4.63	1.19
Best-selling item. We recommend this.	4.76	1.20

Suggestive Content PDF	Mean	Standard Deviation
Since this is best-selling, we recommend this.	4.85	0.91

Table 144. Means and standard deviations of perceived personalization in the seven conditions in empirical study 1

Figure 76. The difference in perceived personalization across the seven conditions in empirical study 1

J.3   Results on Persuasion Awareness – Perceived Persuasion

The means and standard deviations of perceived persuasive intent and perceived agent benefits are presented in Table 145 and Table 146, respectively. Results from a one-way MANOVA demonstrated that there was a significant effect of suggestive content, *Wilk's Λ* = 0.92, $F(12, 912)$ = 14.15, $p < .001$, η_p^2 = .04 with a small effect size. Follow-up tests using a two-way ANOVA were conducted. Results showed that there was a significant effect of the suggestive condition on perceived persuasive intent, $F(6, 457)$ = 4.78, $p < .001$, η_p^2 = .06 with a medium effect size, and on perceived agent benefits, $F(6, 457)$ = 10.05, $p < .001$, η_p^2 = .05 with a small effect size. Follow-up tests using a Games-Howell correction were performed. Results suggested that "We recommend this" had more perceived persuasive intent than the control, $p = .02$, and "Low in

stock," $p = .03$. Also, "Best-selling item. We recommend this." significantly led to a higher level

of perceived persuasive intent than the control, $p = .01$, and "Low in stock," $p = .01$. Similarly,

"Since this is best-selling, we recommend this." significantly resulted in higher perceived

persuasive intent than the control, $p = .03$, and "Low in stock," $p = .03$. In addition, the control

condition had significantly less perceived agent benefits than "We recommend this," $p = .02$,

"Best-selling item. We recommend this.", $p < .001$, "Since this is best-selling, we recommend

this.", $p = .03$. No other significant differences were found, $p > .05$. In sum, these indicated that

the suggestive content had a significant impact on both perceived persuasive intent and agent

benefits. That is, a website featuring a claim (C, C & D, and D → C), except "Buy this item," led

to higher perceived persuasion than the data-only condition as "Low in stock" and the control

condition. The difference in perceived persuasion and agent benefits across the seven conditions

are shown in Figure 77 and Figure 78, respectively.

Suggestive Content PDF	Mean	Standard Deviation
Control	2.75	1.35
Buy this item	2.96	1.62
We recommend this	3.54	1.50
Best-selling item	3.04	1.46
Low in stock	2.80	1.22
Best-selling item. We recommend this.	3.68	1.54
Since this is best-selling, we recommend this.	3.61	1.15

Table 145. Means and standard deviations of perceived persuasive intent in the seven conditions in empirical study 1

Suggestive Content PDF	Mean	Standard Deviation
Control	3.30	1.74

Suggestive Content PDF	Mean	Standard Deviation
Buy this item	3.77	1.82
We recommend this	4.13	1.61
Best-selling item	3.88	1.59
Low in stock	3.90	1.58
Best-selling item. We recommend this.	4.36	1.56
Since this is best-selling, we recommend this.	4.61	1.44

Table 146. Means and standard deviations of perceived agent benefits in the seven conditions in empirical study 1
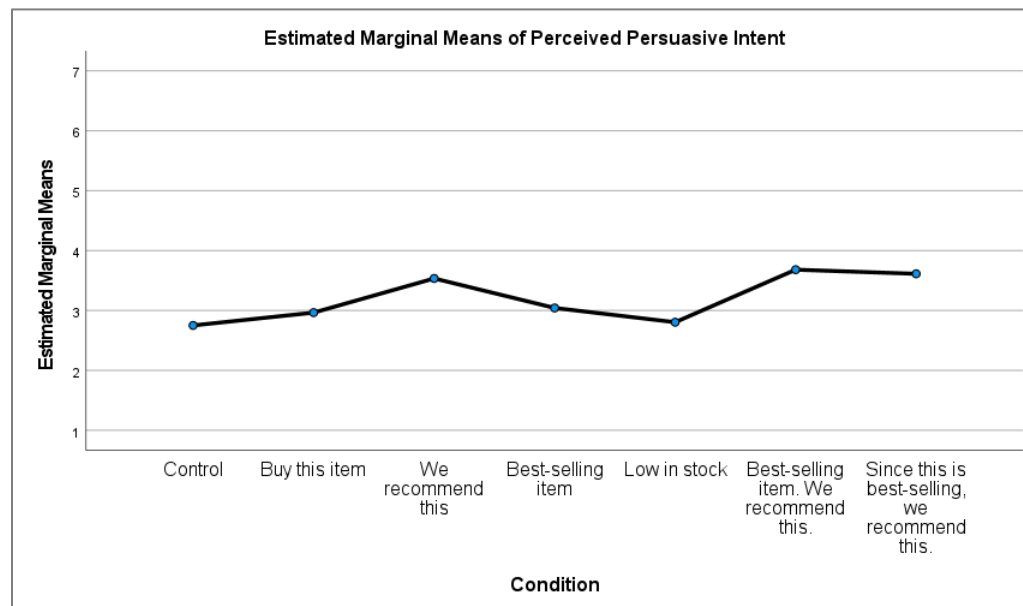
Figure 77. The difference in perceived persuasive intent across the seven conditions in empirical study 1
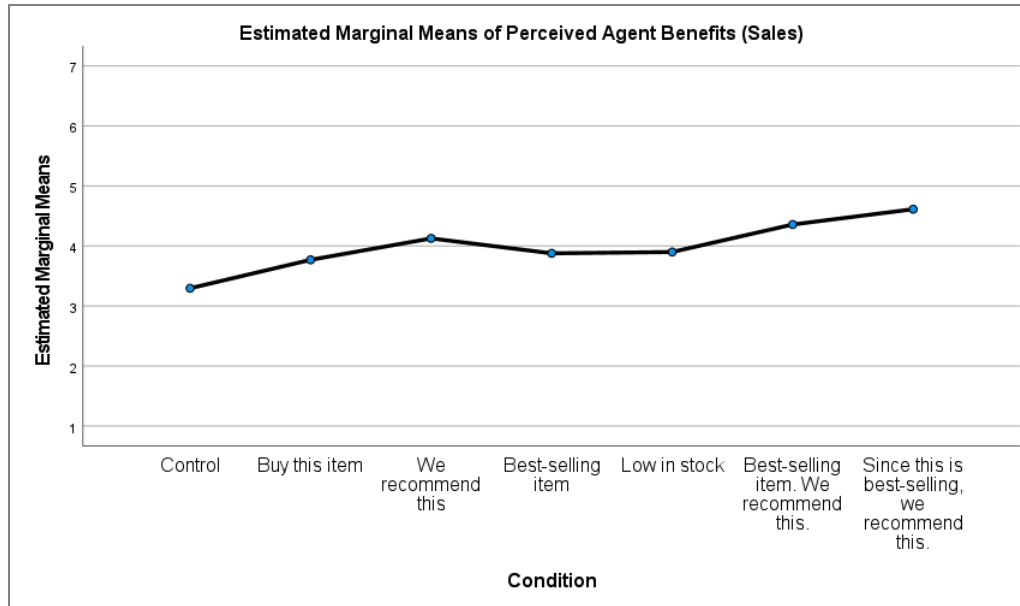
Figure 78. The difference in perceived agent benefits (sales) across the seven conditions in empirical study 1

Also, a one-way ANOVA using the higher-order perceived persuasion (latent variable scores from SmartPLS) was performed. The means and standard deviation of the higher-order perceived persuasion are summarized in Table 147. Results indicated that the condition significantly influenced the higher-order perceived persuasion, $F(6, 457) = 5.14$, $p < .001$, $\eta_p^2 = .06$ with a medium effect size. Follow-up tests using Games-Howell correction was conducted. Results suggested that "We recommend this" significantly led to more persuasive than the control, $p = .01$. Also, "Best-selling item. We recommend this" significantly resulted in more persuasive than the control, $p < .001$, and "Low in stock," $p = .02$, and marginally significantly led to higher perceived persuasion than "Buy this item," $p = .09$. "Since this is best-selling, we recommend this" caused higher perceived persuasion than the control, $p < .001$, and "Low in stock," $p = .02$, and marginally significantly shaped higher perceived persuasion than "Buy this item," $p = .09$. In sum, a website featuring a claim (C, C & D, and D → C), except "Buy this item," led to a higher degree of the higher-order perceived persuasion than the control, the data-only (D) content as "Low in stock,"

and "Buy this item." See Figure 79 for the difference in the higher-order perceived persuasion across the seven conditions.

Suggestive Content PDF	Mean	Standard Deviation
Control	-0.35	0.97
Buy this item	-0.13	1.12
We recommend this	0.22	1.01
Best-selling item	-0.07	0.97
Low in stock	-0.17	0.84
Best-selling item. We recommend this.	0.36	0.98
Since this is best-selling, we recommend this.	0.40	0.76

Table 147. Means and standard deviations of the higher-order perceived persuasion in the seven conditions in empirical study 1
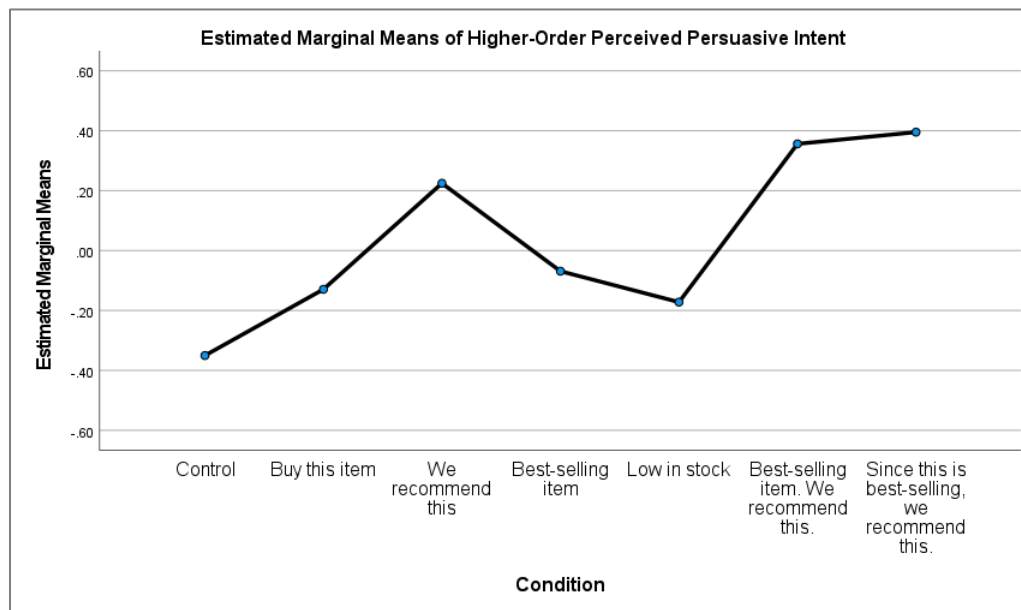
Figure 79. The difference in the higher-order perceived persuasion across the seven conditions in empirical study 1

J.4 Results on Persuasion Awareness – Perceived Assistance

The means and standard deviations of perceived assistive intent and perceived user benefits appear in Table 148 and Table 149, respectively. Results from a one-way MANOVA demonstrated that there was no significant effect of suggestive content, $Wilk's\ \Lambda = 0.97$, $F(12, 912) = 1.38$, $p = .17$, $\eta_p^2 = .02$ with a small effect size. Thus, the suggestive content did not affect both perceived assistive intent and perceived user benefits. Figure 80 and Figure 81 depict the difference in perceived assistive intent and user benefits across the seven conditions, respectively.

Suggestive Content PDF	Mean	Standard Deviation
Control	4.64	1.48
Buy this item	4.83	1.42
We recommend this	4.83	1.27
Best-selling item	5.04	1.35
Low in stock	5.02	1.31
Best-selling item. We recommend this.	5.06	1.24
Since this is best-selling, we recommend this.	5.41	0.96

Table 148. Means and standard deviations of perceived assistive intent in the seven conditions in empirical study 1

Suggestive Content PDF	Mean	Standard Deviation
Control	4.92	1.30
Buy this item	4.99	1.28
We recommend this	5.01	1.28
Best-selling item	5.10	1.27
Low in stock	5.04	1.19
Best-selling item. We recommend this.	5.37	1.15

Suggestive Content PDF	Mean	Standard Deviation
Since this is best-selling, we recommend this.	5.18	1.14

Table 149. Means and standard deviations of perceived user benefits in the seven conditions in empirical study 1
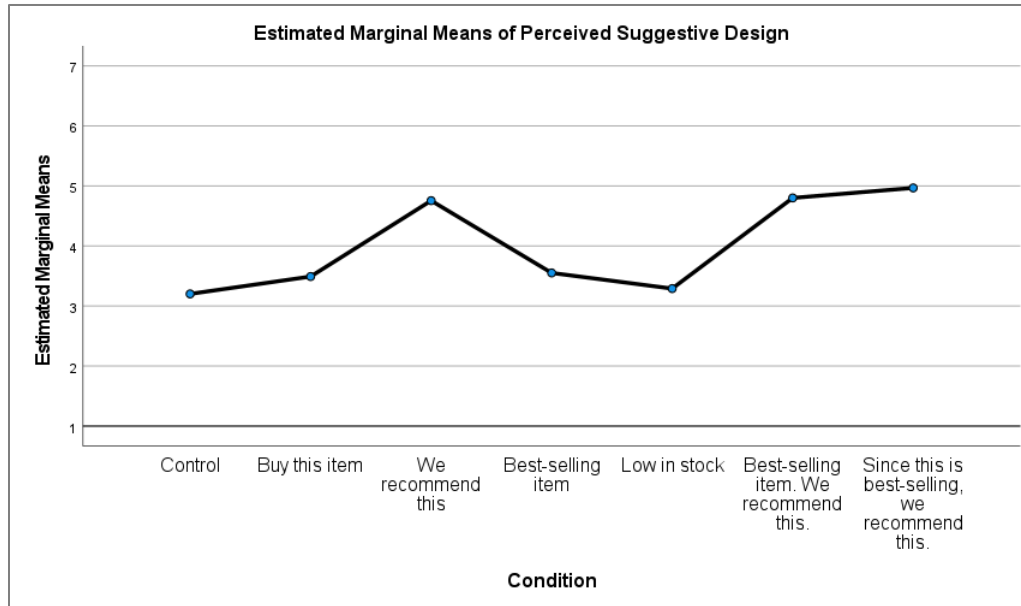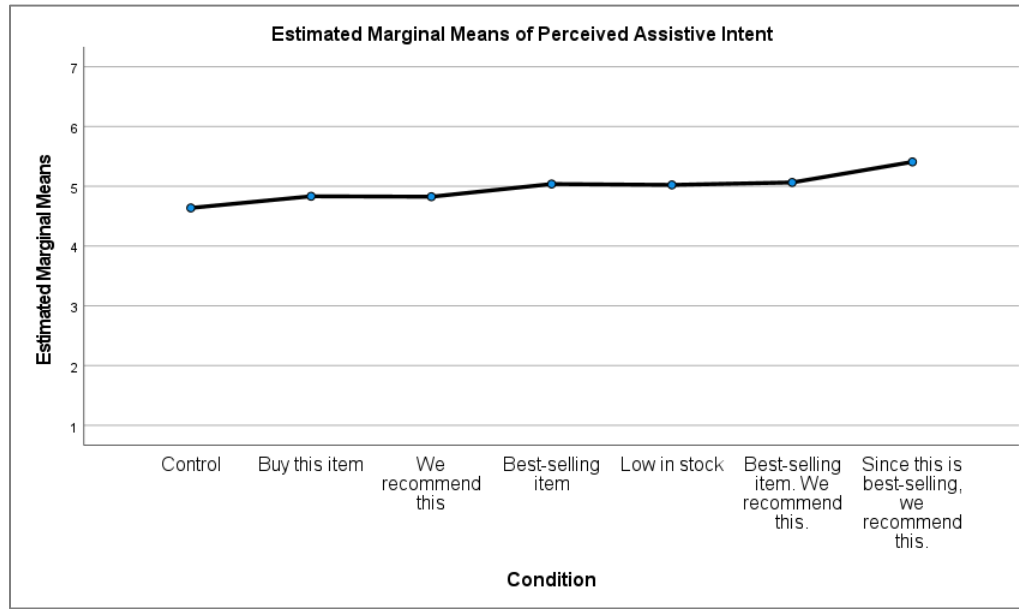

Figure 80. The difference in perceived assistive intent across the seven conditions in empirical study 1
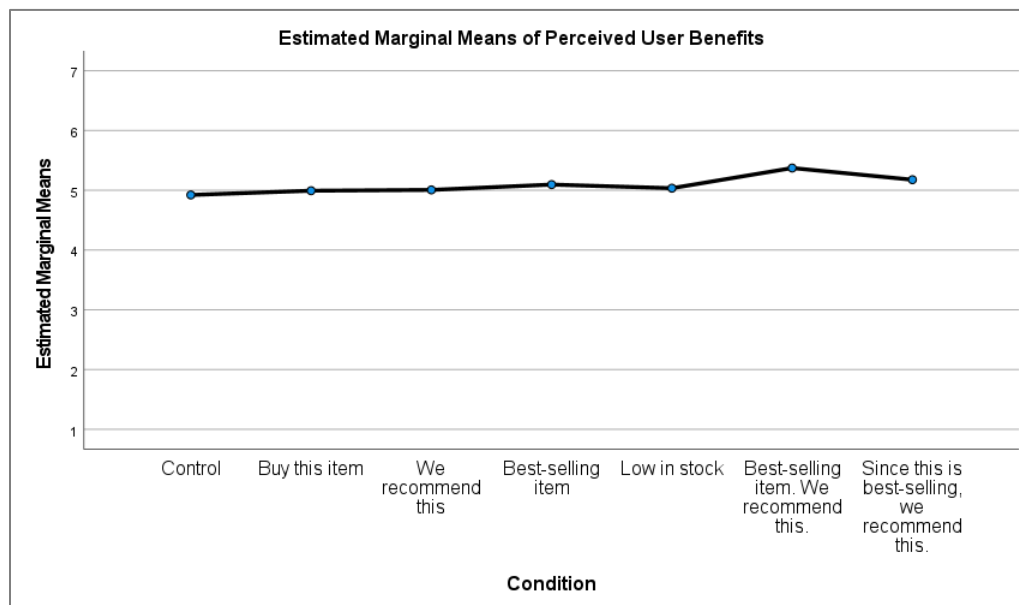
Figure 81. The difference in perceived user benefits across the seven conditions in empirical study 1

A one-way ANOVA using the higher-order perceived assistance was performed. The means and standard deviation of the higher-order perceived assistance are summarized in Table 150. Results showed no significant effect of the condition, $F(6, 457) = 1.34$, $p = .24$, $\eta_p^2 = .02$ with a small effect size. Thus, the suggestive content condition did not influence the high-order perceived assistance. See the difference in the higher-order perceived assistance across all conditions in Figure 82.

Suggestive Content PDF	Mean	Standard Deviation
Control	-0.20	1.11
Buy this item	-0.08	1.04
We recommend this	-0.08	0.99
Best-selling item	0.06	1.02
Low in stock	0.03	0.96
Best-selling item. We recommend this.	0.17	0.91
Since this is best-selling, we recommend this.	0.26	0.84

Table 150. Means and standard deviations of the higher-order perceived assistance in the seven conditions in empirical study 1
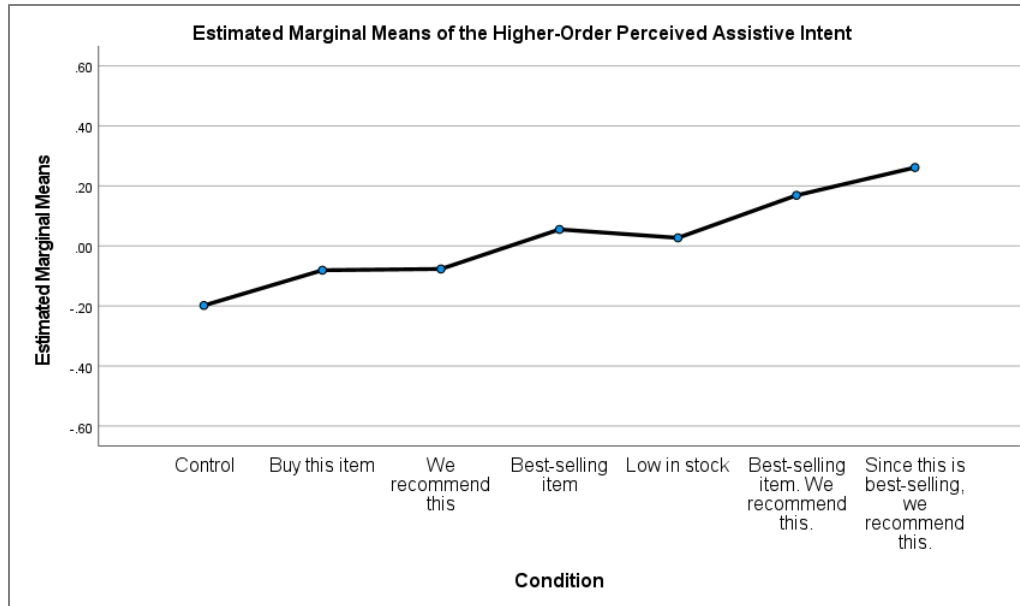
Figure 82. The difference in the higher-order perceived assistance across the seven conditions in empirical study 1

J.5   Results on Perceived User Costs

The means and standard deviations are reported in Table 151. Results from a one-way ANOVA revealed that there was no significant effect of suggestive content, $F(6, 457) = 0.33$, $p = .19$, $\eta_p^2 <$ .001 with a trivial effect size. Thus, the suggestive content condition did not influence perceived user costs. Figure 83 presents the difference in perceived user costs across the seven conditions.

Suggestive Content PDF	Mean	Standard Deviation
Control	4.75	1.69
Buy this item	4.99	1.59
We recommend this	4.78	1.42
Best-selling item	4.77	1.62
Low in stock	4.65	1.34
Best-selling item. We recommend this.	4.74	1.66
Since this is best-selling, we recommend this.	4.74	1.48

Table 151. Means and standard deviations of perceived user costs in the seven conditions in empirical study 1
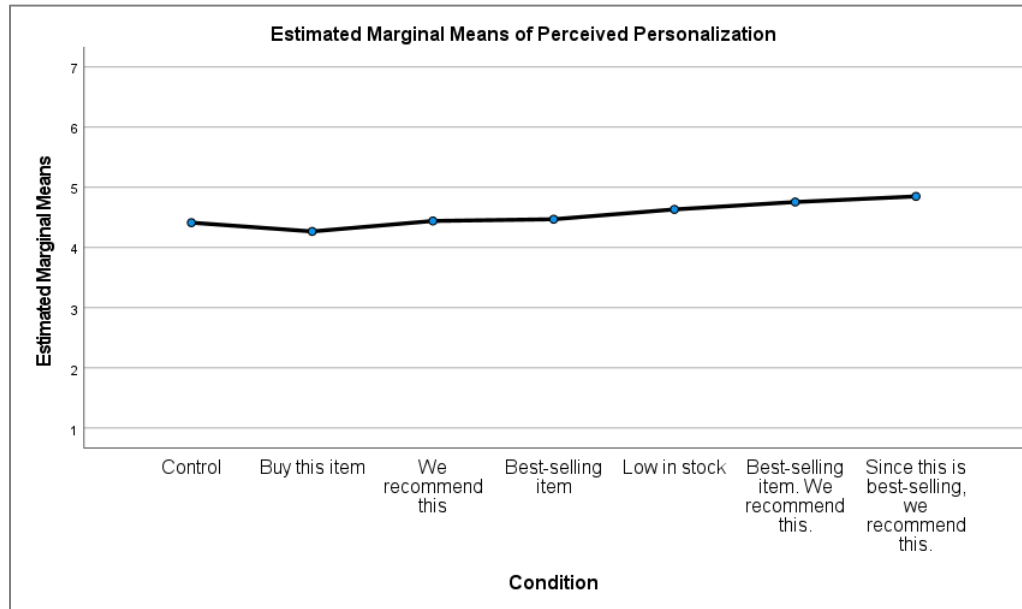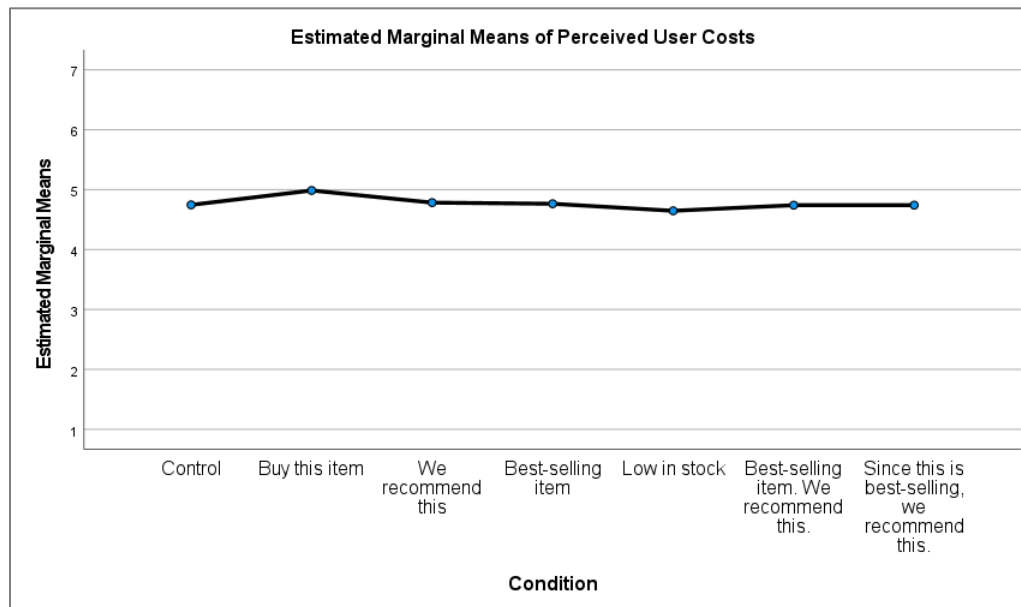

Figure 83. The difference in perceived user costs across the seven conditions in empirical study 1

J.6 Results on Perceived Agent Costs

The means and standard deviations are reported in Table 152. Results from a one-way ANOVA revealed that there was no significant effect of suggestive content, $F(6, 457) = 1.01$, $p = .42$, $\eta_p^2 = .01$ with a small effect size. Consequently, the suggestive content condition did not affect perceived agent costs. Figure 84 depicts the difference in perceived agent costs across the seven conditions.

Suggestive Content PDF	Mean	Standard Deviation
Control	4.40	1.44
Buy this item	4.72	1.59
We recommend this	4.42	1.54
Best-selling item	4.63	1.54
Low in stock	4.71	1.39
Best-selling item. We recommend this.	4.92	1.36

Suggestive Content PDF	Mean	Standard Deviation
Since this is best-selling, we recommend this.	4.57	1.56

Table 152. Means and standard deviations of perceived agent costs in the seven conditions in empirical study 1
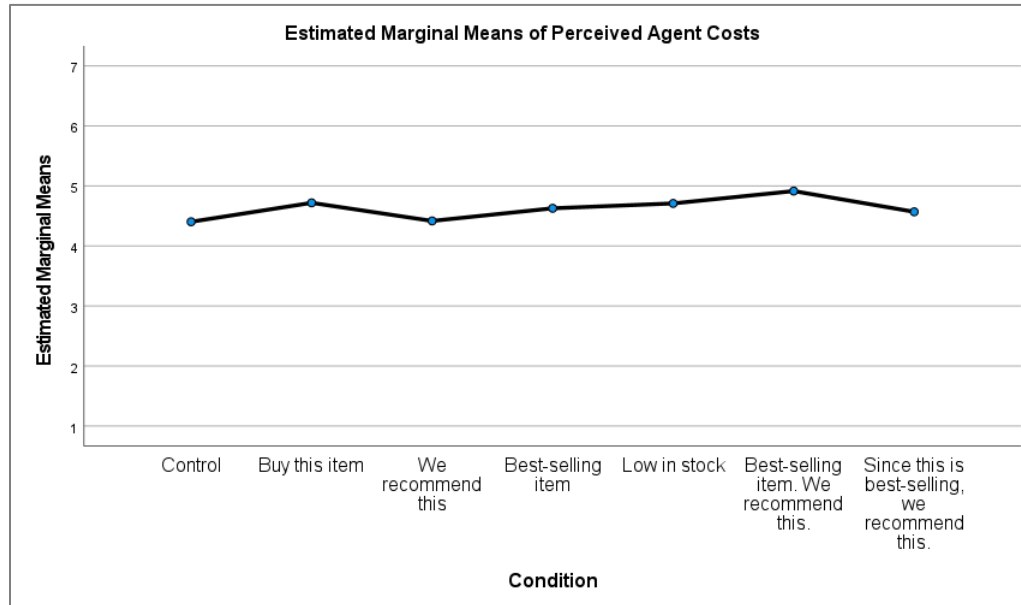
Figure 84. The difference in perceived agent costs across the seven conditions in empirical study 1

Appendix K Additional Analyses in Empirical Study 1

K.1   Perceived User Costs

The Cronbach's alpha for the Perceived User Costs scale was 0.85, suggesting sufficient internal consistency reliability. A two-way ANOVA with the claim and data condition was analyzed. The means and standard deviations are presented in Table 153. Results indicated no significant effect of the claim condition, $F(1, 460) = 0.33$, $p = .56$, $\eta_p^2 < .001$ with a trivial effect size, no significant effect of the data condition, $F(1, 460) = 0.37$, $p = .54$, $\eta_p^2 < .001$ with a trivial effect size, and no interaction between claim and data, $F(1, 460) = 0.13$, $p = .72$, $\eta_p^2 < .001$ with a trivial effect size. Specifically, both claim and data content did not affect perceived user costs. See Figure 85 for the difference in perceived user costs between the claim and the data condition.

Suggestive Content PDF		Mean	Standard Deviation
Claim	**Data**		
No claim	No data	4.75	1.69
	Data	4.71	1.49
	Total	4.72	1.55
Claim	No data	4.89	1.51
	Data	4.74	1.60
	Total	4.83	1.54
Total	No data	4.84	1.57
	Data	4.72	1.53
	Total	4.78	1.55

Table 153. Means and standard deviations of perceived user costs in the claim and the data condition in empirical study 1
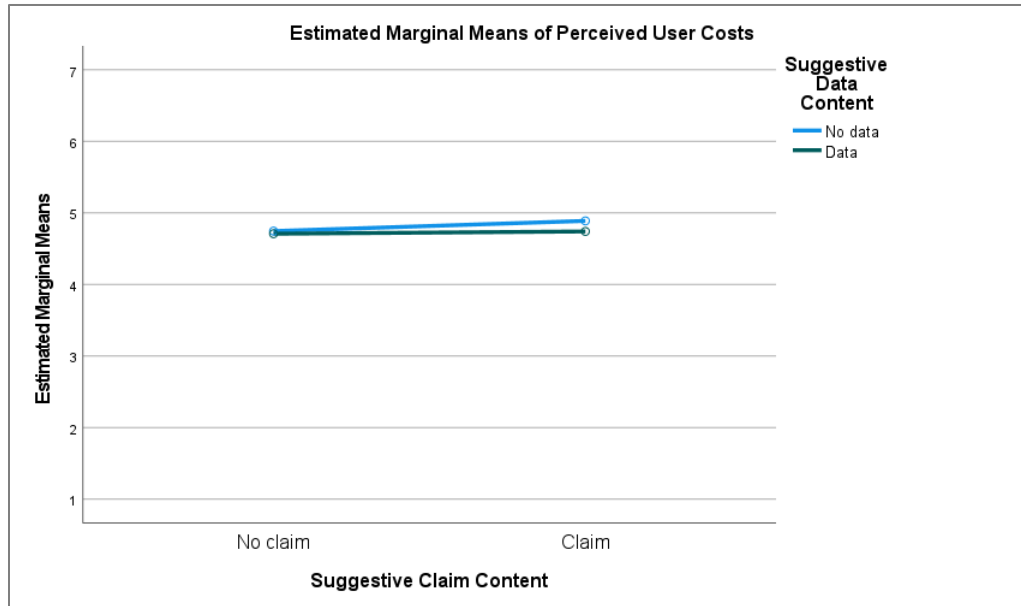
Figure 85. The difference in perceived user costs between the claim and the data condition in empirical study 1

Moreover, a one-way ANOVA was performed to investigate the difference among the no claim – no data (control), the claim-only (C, "We recommend this"), the data-only (D, "Best-selling item"), the claim & data (C & D, "Best-selling item. We recommend this."), and the data → claim (D → C, "Since this is best-selling, we recommend this."). Results showed that no significant effect of the suggestive condition, $F(4, 313) = 0.01$, $p = 1.00$, $\eta_p^2 < .001$ with no effect size. This indicated that there was no difference in perceived user costs among these five conditions. However, this is expected, as I hypothesize that invocation style will influence perceived user costs, not the suggestive content.

As the invocation style is not manipulated in experiment 1 and 2, I do not expect that the suggestive content makes any difference in perceived user costs. The above analyses echo this prediction. In both experiments, the automatic invocation style is implemented. Therefore, users are not required to exert their costs, such as effort, in viewing the suggestive content. This is not different from the control condition.

K.2 Perceived Persuasion (Higher-Order Construct Score)

Effect of claim and data. For the sake of parsimony, I conducted a two-way ANOVA with the claim and data content using the higher-order perceived persuasion score. The means and standard deviations of the higher-order perceived persuasion appear in Table 154. Table 155 reports the statistics. Results showed a significant effect of claim content with a small effect size, a significant effect of data content with a small effect size, and no claim x data interaction with a trivial effect size. That is, providing claim or data content resulted in higher perceived persuasion. In other words, providing either claim or data content increased perceived persuasion. See Figure 86 for the difference in the higher-order perceived persuasion between the claim and data condition.

Suggestive Content PDF		Mean	Standard Deviation
Claim	**Data**		
No claim	No data	-0.35	0.97
	Data	-0.12	0.91
	Total	-0.19	0.93
Claim	No data	0.04	1.08
	Data	0.37	0.92
	Total	0.17	1.03
Total	No data	-0.09	1.06
	Data	0.08	0.94
	Total	0.00	1.00

Table 154. Means and standard deviations of the higher-order perceived persuasion in the claim and the data condition in empirical study 1

Effect	$F(1, 460)$	p	η_p^2
Claim	21.32	.00	.04
Data	8.65	.00	.02
Claim x data	0.25	.62	.00

Table 155. Two-way ANOVA in the higher-order perceived persuasion in empirical study 1
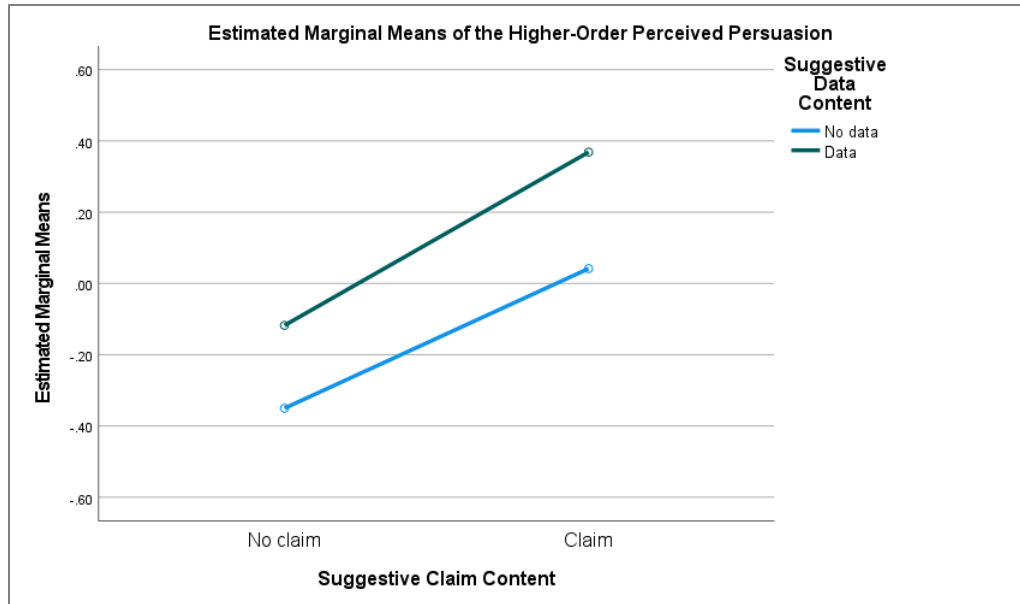
Figure 86. The difference in the higher-order perceived persuasion between the claim and the data condition in empirical study 1

Difference among the five conditions. Additionally, I examined the difference in the higher-order perceived persuasion among the claim-only (C, "We recommend this"), the data-only (D, "Best-selling item"), the claim & data (C & D, "Best-selling item. We recommend this."), the data-supporting-claim (D → C, "Since this is best-selling, we recommend this."), and the control (no claim – no data). Results from a one-way ANOVA indicated a significant effect of the condition, $F(4, 313) = 6.59$, $p < .001$, $\eta_p^2 = .08$ a medium effect size. Follow-up tests using a Bonferroni correction revealed that D significantly induced higher perceived persuasion than the control. Also, C & D significantly stimulated higher perceived persuasion than the control, and marginally significantly shaped higher perceived persuasion than D. D → C significantly resulted in higher perceived persuasion than the control. Specifically, a website featuring a claim (C, C & D, and D → C) caused higher perceived persuasion than a website in the control condition (no C – no D), and C & D led to higher perceived persuasion than that featuring D.

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(I) Condition	(J) Condition	Mean Difference (I – J)	SE	p	95% CI	
					LL	UL
1 Control	2	-0.57***	0.16	.00	-1.03	-0.12
	3	-0.28	0.16	.76	-0.73	0.17
	4	-0.71***	0.16	.00	-1.17	-0.24
	5	-0.75***	0.21	.00	-1.33	-0.16
2 We recommend this	1	0.57***	0.16	.00	0.12	1.03
	3	0.29	0.16	.65	-0.15	0.74
	4	-0.13	0.16	1.00	-0.60	0.33
	5	-0.17	0.21	1.00	-0.76	0.42
3 Best-selling item	1	0.28	0.16	.76	-0.17	0.73
	2	-0.29	0.16	.65	-0.74	0.15
	4	-0.43*	0.16	.09	-0.88	0.03
	5	-0.46	0.20	.24	-1.04	0.11
4 Best-selling item. We recommend this.	1	0.71***	0.16	.00	0.24	1.17
	2	0.13	0.16	1.00	-0.33	0.60
	3	0.43*	0.16	.09	-0.03	0.88
	5	-0.04	0.21	1.00	-0.63	0.55
5 Since this is best-selling, we recommend this.	1	0.75***	0.21	.00	0.16	1.33
	2	0.17	0.21	1.00	-0.42	0.76
	3	0.46	0.20	.24	-0.11	1.04

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(I) Condition	(J) Condition	Mean Difference (I − J)	SE	p	95% CI	
					LL	UL
	4	0.04	0.21	1.00	-0.55	0.63

Note: * $p < .01$, ** $p < .05$, *** $p < .001$, CI = confidence interval, LL = lower limit, UL = upper limit

Table 156. Multiple comparisons of the suggestive content conditions in terms of the higher-order perceived persuasion using a Bonferroni correction in empirical study 1

K.3 Perceived Assistance (Higher-Order Construct Score)

Effect of claim and data. For the sake of parsimony, I conducted a two-way ANOVA with the claim and data condition using the higher-order assistance score. The means and standard deviations of the higher-order perceived assistance appear in Table 157. Table 158 reports the statistics. Results showed no significant effect of claim content with a trivial effect size, a significant effect of data content with a small effect size, and no claim x data interaction with a trivial effect size. That is, data content led to higher perceived assistance than no data content. See the difference in the higher-order perceived assistance between the claim and data condition in Figure 87.

Suggestive Content PDF			Mean	Standard Deviation
Claim	**Data**			
No claim	No data		-0.20	1.11
	Data		0.04	0.99
	Total		-0.04	1.03
Claim	No data		-0.08	1.01
	Data		0.20	0.89
	Total		0.03	0.97
Total	No data		-0.12	1.04
	Data		0.10	0.95
	Total		0.00	1.00

Table 157. Means and standard deviations of the higher-order perceived assistance in the claim and the data condition in empirical study 1

Effect	$F(1, 460)$	p	η_p^2
Claim	2.03	.16	.00
Data	7.12	.01	.02
Claim x data	0.04	.85	.00

Table 158. Two-way ANOVA in the higher-order perceived assistance in empirical study 1
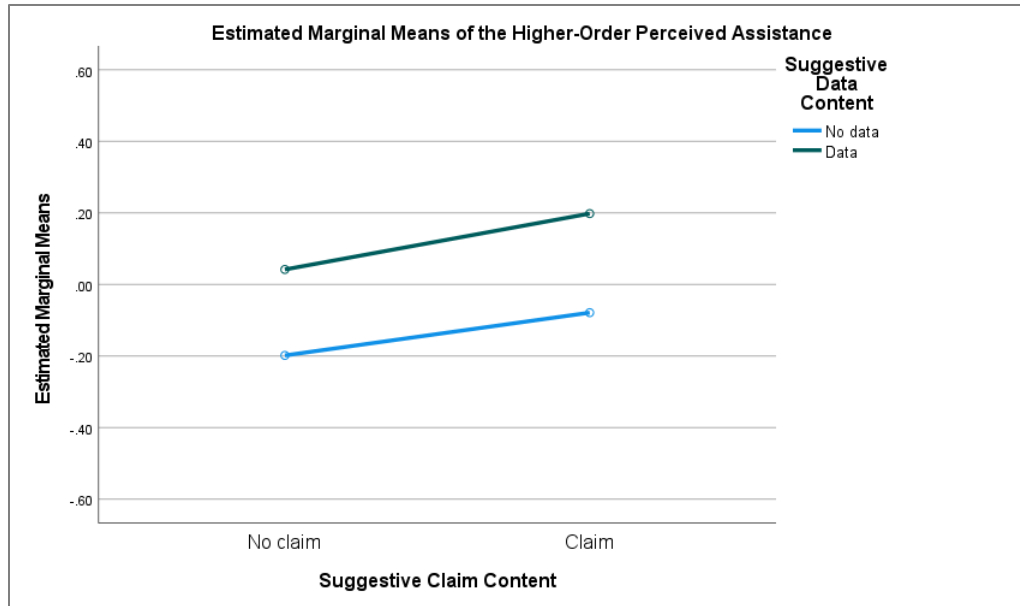
Figure 87. The difference in the higher-order perceived assistance between the claim and the data condition in empirical study 1

Difference among the five conditions. A one-way ANOVA was performed to assess the difference in the higher-order perceived assistance among the claim-only (C, "We recommend this"), the data-only (D, "Best-selling item"), the claim & data (C & D, "Best-selling item. We recommend this."), the data → claim (D → C, "Since this is best-selling, we recommend this."), and the control (no claim – no data). Results indicated that there was no significant difference in the higher-order perceived assistance across the four conditions, $F(4, 313) = 1.86$, $p = .12$, $\eta_p^2 = .02$ with a small effect size. Thus, the four conditions did not differ in terms of perceived assistance.

K.4   Additional Evidence of Objective-Behavioral Responses and Product Placement

Targeted Product Placement. I included an experiment batch (experiment 1 and 2) as another factor, since the targeted product's position differed between experiment 1 and 2. In experiment 1, a targeted product was fixed to product number 5 in row 2. In experiment 2, a targeted product was randomly placed in rows 2, 5, or 8. Thus, the first experiment has a fixed targeted product position, whereas the second one involves a random targeted product position. If there is a

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significant difference between the two experiments, targeted product placement, such as the row, will play a role. This also suggests that the primacy or recency effect might take place. For instance, a targeted product on top of the page (row 2) or at the bottom of the page (row 8) will be more likely to attract users' consideration and decision than that in the middle (row 5).

A three-way ANOVA with claim, data, and batch as an independent variable was conducted to examine the effect of the experiment batch in addition to claim and data content. For the manipulation checks, there was no significant effect of the experiment batch on perceived suggestive design, $F(1, 456) = 1.22$, $p = .27$, $\eta_p^2 < .001$ with a trivial effect size, perceived claim content, $F(1, 456) = 1.36$, $p = .46$, $\eta_p^2 < .001$ with a trivial effect size, data, $F(1, 456) = 0.08$, $p = .78$, $\eta_p^2 < .001$ with a trivial effect size, and perceived informative design, $F(1, 456) = 0.08$, $p = .78$, $\eta_p^2 < .001$ with a trivial effect size. Therefore, the product placement did not have an impact on manipulation checks.

However, the experiment batch significantly influenced perceived persuasive intent and agent benefits, *Wilk's* $\Lambda = 0.97$, $F(2, 455) = 3.50$, $p = .03$, $\eta_p^2 = .02$ with a small effect size. Also, there was a marginally significant interaction between data and batch, *Wilk's* $\Lambda = 0.99$, $F(2, 455) = 2.46$, $p = .09$, $\eta_p^2 = .01$ with a small effect size. A further three-way ANOVA revealed that there was a significant effect of the batch on perceived persuasive intent, $F(1, 456) = 4.64$, $p = .03$, $\eta_p^2 = .01$ with a small effect size, and perceived agent benefits, $F(1, 456) = 6.39$, $p = .01$, $\eta_p^2 = .01$ with a small effect size. That is, the fixed target position significantly led to higher perceived persuasive intent ($M_{Batch1} = 3.32$, $SE_{Batch1} = 0.10$, $M_{Batch2} = 3.02$, $SE_{Batch2} = 0.10$) and agent benefits ($M_{Batch1} = 4.13$, $SE_{Batch1} = 0.12$, $M_{Batch2} = 3.73$, $SE_{Batch2} = 0.11$) than the random target position. Also, there was a marginally significant data x batch interaction on perceived persuasive intent, $F(1, 456) =$

3.65, $p = .06$, $\eta_p^2 = .01$ with a small effect size, and perceived agent benefits, $F(1, 456) = 4.22$, $p = .04$, $\eta_p^2 = .01$ with a small effect size. Follow-up analyses using a Bonferroni correction were applied. Results showed that only in the presence of data content, the fixed target position significantly led to higher perceived persuasive intent ($M_{DataBatch1} = 3.62$, $SE_{DataBatch1} = 0.15$, $M_{DataBatch2} = 3.05$, $SE_{DataBatch2} = 0.12$), $p < .001$, and agent benefits ($M_{DataBatch1} = 4.61$, $SE_{DataBatch1} = 0.17$, $M_{DataBatch2} = 3.88$, $SE_{DataBatch2} = 0.14$), $p < .001$, than the random position. There was no significant difference in both perceptions in the absence of data. In sum, a website featuring data content stimulated higher perceived persuasive intent and agent benefits than a website without such content. Also, providing data about a fixed targeted product in row 2 increased users' perceived persuasive intent and agent benefits, compared with providing data to a random position in rows 2, 5, and 8. Without data, a website featuring a fixed target position in row 2 did not differ in both perceptions from that featuring a random position in rows 2, 5, and 8. One possible explanation might be that the fixed targeted product in row 2 draw users' attention more and thus make themselves more salient, thereby amplifying perceived persuasive intent and agent benefits. On the contrary, the random position would be less likely to make the suggest content salient.

Additionally, I evaluated the effect of the batch on the higher-order perceived persuasion. Results from a three-way ANOVA indicated a significant effect of the batch, $F(1, 456) = 6.45$, $p = .01$, $\eta_p^2 = .01$ with a small effect size, a significant claim x batch interaction, $F(1, 456) = 4.06$, $p = .05$, $\eta_p^2 = .01$ with a small effect size, and a significant data x batch interaction, $F(1, 456) = 4.61$, $p = .03$, $\eta_p^2 = .01$ with a small effect size. No other significant effects were found. Specifically, the fixed target position resulted in higher perceived persuasion than the random target position ($M_{Batch1} = 0.13$, $SE_{Batch1} = 0.07$, $M_{Batch2} = -0.11$, $SE_{Batch2} = 0.07$), $p = .01$. Also, in the presence of claim content, the fixed target position increased perceived persuasion ($M_{ClaimBatch1} = 0.46$,

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$SE_{ClaimBatch1} = 0.10$, $M_{ClaimBatch2} = 0.03$, $SE_{ClaimBatch2} = 0.08$), $p < .001$, while it was not the case in the absence of claim ($M_{NoClaimBatch1} = -0.21$, $SE_{NoClaimBatch1} = 0.10$, $M_{NoClaimBatch2} = -0.26$, $SE_{NoClaimBatch2} = 0.10$), $p = .72$. Likewise, in the presence of data content, the fixed target position led to higher perceived persuasion than the random target position ($M_{DataBatch1} = 0.39$, $SE_{DataBatch1} = 0.15$, $M_{DataBatch2} = -0.06$, $SE_{DataBatch2} = 0.08$), $p < .001$, whereas no difference between the two batches was found in the absence of data content ($M_{NoDataBatch1} = -0.13$, $SE_{NoDataBatch1} = 0.10$, $M_{NoDataBatch2} = -0.17$, $SE_{NoDataBatch2} = 0.10$), $p = .79$. Overall, these results echoed the impact of targeted product placement on perceived persuasion.

The experiment batch did not significantly affect perceived assistive intent and user benefits, *Wilk's* $\Lambda = 1.00$, $F(2, 455) = 0.59$, $p = .56$, $\eta_p^2 < .001$ with a trivial effect size, perceived user costs, $F(1, 456) = 0.23$, $p = .63$, $\eta_p^2 < .001$, with a trivial effect size, and perceived agent costs, $F(1, 456) = 1.42$, $p = .23$, $\eta_p^2 < .001$, with a trivial effect size. Similarly, the batch did not have a significant impact on the higher-order perceived assistance, $F(1, 456) = 0.14$, $p = .71$, $\eta_p^2 < .001$, with a trivial effect size. As a result, the targeted product position did not influence perceived assistive intent and user benefits, perceived user costs, and perceived agent costs.

Objective-Behavioral Responses. In experiment 1, a targeted product was fixed. This allows me to compare the difference between targeted product selection and consideration in the seven treatment conditions and those in the control condition, despite the control having no target. This analysis is not applicable to experiment 2 with a random targeted product, as the control condition did not possess a target and the targeted product cannot fairly been assigned to it. A Chi-square test was performed on both physical behaviors. Results showed that there was no significant association between the suggestive content and targeted product selection, $\chi^2(5) = 6.65$, $p = .25$.

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The number and proportion of targeted product selected and not selected are shown in Figure 88. However, there was a significant relationship between the suggestive content condition and targeted product consideration, $\chi^2(5) = 17.15$, $p < .001^2$. Follow-up Z tests using a Bonferroni correction revealed that those in the control condition considered a targeted product less than those in the treatment conditions, $p < .05$. See Figure 89.
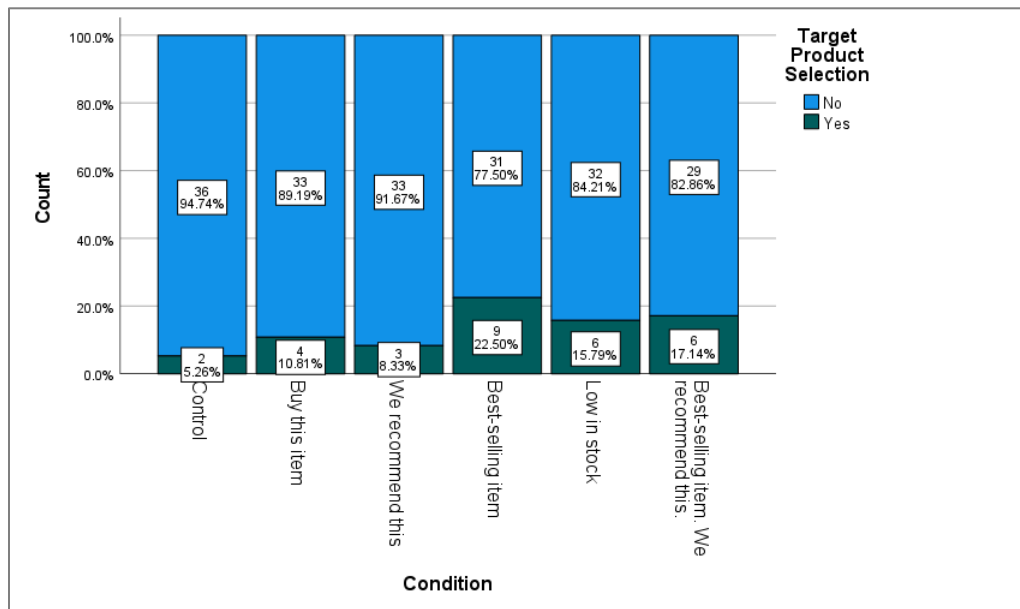
Figure 88. Targeted product selection in the seven conditions in empirical study 1

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^{2} 3 cells (25.0%) have expected count less than 5.
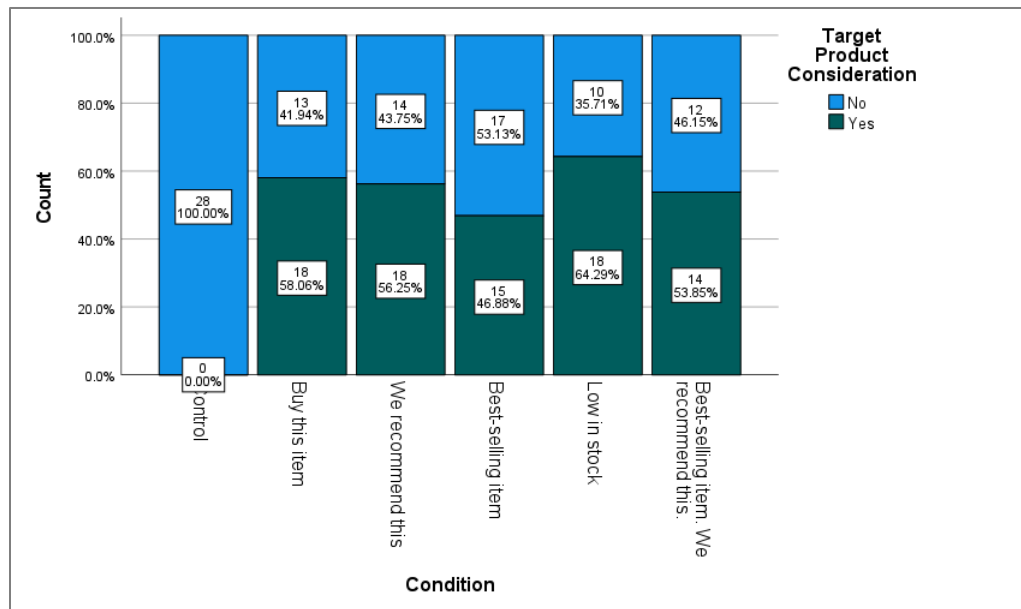
Figure 89. Targeted product consideration in the seven conditions in empirical study 1

In addition, I analyzed the relationship between the claim and data content, and the two objective

behaviors. A Chi-square analysis on targeted product selection was conducted. Results indicated

that there was no significant effect of claim content, $\chi^2(1) = 0.33$, $p = .57$, no significant effect of

a claim without data, $\chi^2(1) = 0.63$, $p = .43^3$, and no significant effect of a claim with data, $\chi^2(1) =$

0.07, $p = .79$. See Figure 90. However, for the targeted product consideration, there was a

significant effect of claim content, $\chi^2(1) = 6.20$, $p = .01$, a significant effect of a claim without data,

$\chi^2(1) = 26.47$, $p < .001$, and no significant effect of a claim with data, $\chi^2(1) = 0.01$, $p = .92$. Follow-

up Z tests using a Bonferroni correction revealed that those with no claim considered a target less

than those with a claim, $p < .05$. In the absence of data, those without a claim (control) considered

a targeted product less than those with a claim (C), $p < .05$. In the presence of data, those without

a claim (D) did not consider a target differently from those with a claim (C & D and D → C), $p >$

.05. See Figure 91.

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[3] 1 cell (25.0%) have expected count less than 5.
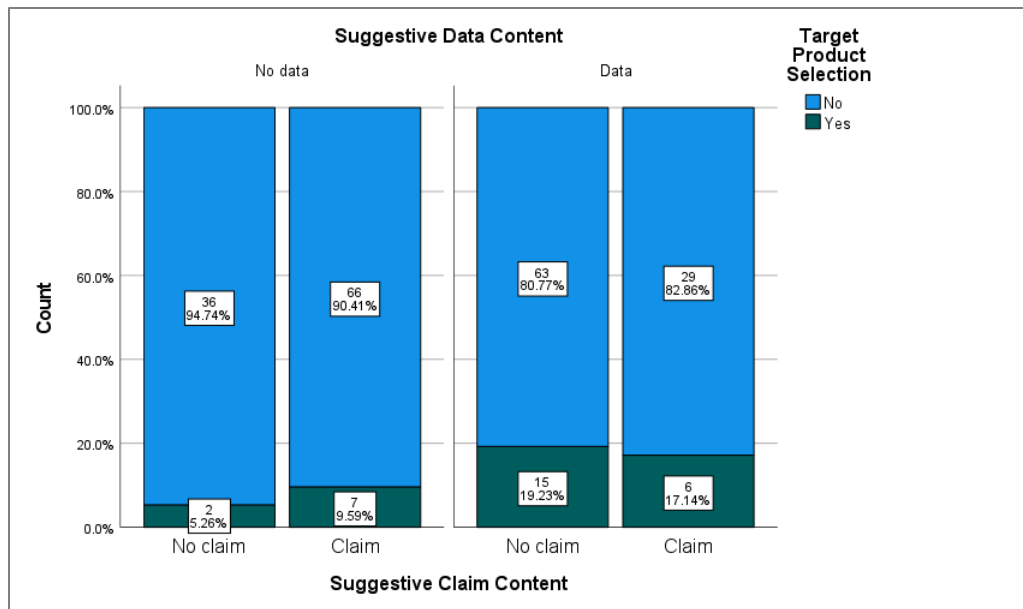
Figure 90. Targeted product selection between the claim and the data condition in empirical study 1
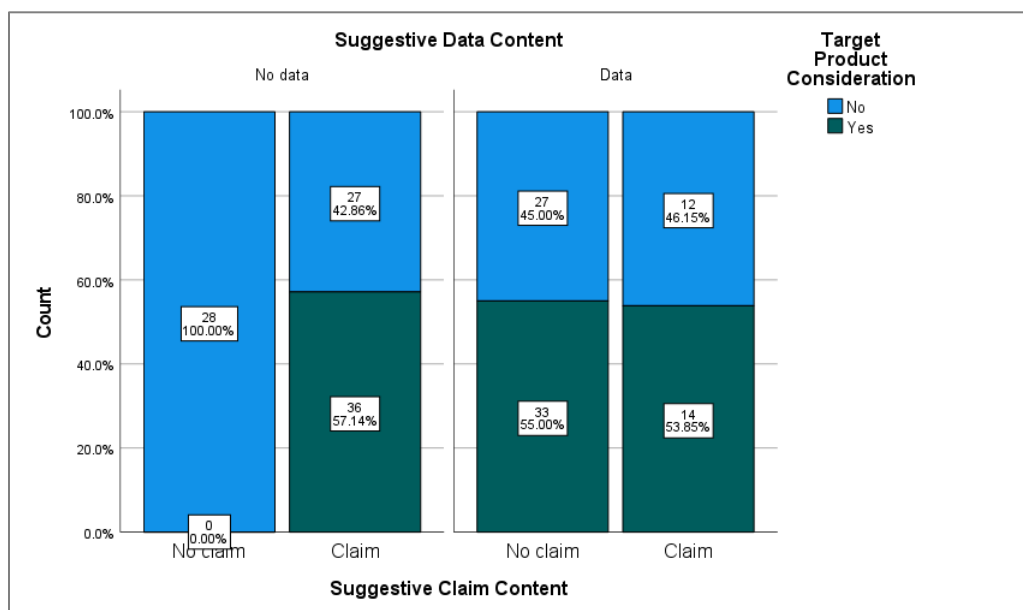
Figure 91. Targeted product consideration between the claim and the data condition in empirical study 1

Moreover, I pooled objective responses of the treatment conditions only from the two experiments to evaluate whether claim content, data content, targeted product row, and targeted product column influence the probability of two physical behaviors performed. Results from a binary logistic regression of targeted product selection and consideration are reported in Table 159 and Table 160, respectively. These revealed that only the targeted product row was a significant predictor.

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Specifically, the odds of having a targeted product selected was predicted to decrease by a factor of 0.31 comparing a targeted product placed in row 5 with that in row 2, controlling for claim content, data content, and targeted product column. Likewise, the odds of having a targeted product considered was predicted to decrease by a factor of 0.50 comparing a targeted product assigned to row 5 with that in row 2, partialling out other factors. Overall, this suggests the primacy and recency effect. In other words, a target in the top and the bottom row influences users' product choice and consideration more than that in the middle row.

Effect	*B*	*SE*	Wald χ^2	*df*	*p*	*OR*	95% CI	
							LL	*UL*
Claim[a]	0.16	0.38	0.19	1	.67	1.18	0.56	2.45
Data[b]	0.38	0.39	0.96	1	.33	1.46	0.68	3.13
Targeted product row[c]			4.20	2	.12			
Targeted product row 5	-1.18	0.59	4.04	1	.04	0.31	0.10	0.97
Targeted product row 8	-0.11	0.46	0.05	1	.82	0.90	0.37	2.20
Targeted product column[d]			4.92	3	.18			
Targeted product column 2	0.13	0.52	0.06	1	.81	1.13	0.41	3.12
Targeted product column 3	0.89	0.57	2.45	1	.12	2.44	0.80	7.42

Effect	B	SE	Wald χ²	df	p	OR	95% CI	
							LL	UL
Targeted product column 4	-0.38	0.68	0.30	1	.58	0.69	0.18	2.61
Constant	-2.20	0.67	10.95	1	.00	0.11		

Note: [a] 0 = no claim, 1 = claim, [b] 0 = no data, 1 = data, [c] referenced row = 2, [d] referenced column = 1, *OR* = odds ratio, CI = confidence interval, *LL* = lower limit, *UL* = upper limit

Table 159. Results of binary logistic regression of targeted product selection in empirical study 1

Effect	B	SE	Wald χ²	df	p	OR	95% CI	
							LL	UL
Claim content	0.29	0.32	0.81	1	.37	1.33	0.71	2.48
Data content	0.39	0.31	1.62	1	.20	1.48	0.81	2.71
Targeted product row			3.20	2	.20			
Targeted product row 5	-0.69	0.39	3.20	1	.07	0.50	0.23	1.07
Targeted product row 8	-0.27	0.39	0.47	1	.49	0.77	0.36	1.64
Targeted product column			3.28	3	.35			
Targeted product column 2	0.30	0.38	0.63	1	.43	1.35	0.64	2.85
Targeted product column 3	-0.51	0.49	1.10	1	.29	0.60	0.23	1.56

Effect	B	SE	Wald χ^2	df	p	OR	95% CI	
							LL	UL
Targeted product column 4	0.12	0.46	0.07	1	.79	1.13	0.46	2.79
Constant	-0.50	0.52	0.95	1	.33	0.61		

Note: [a] 0 = no claim, 1 = claim, [b] 0 = no data, 1 = data, [c] referenced row = 2, [d] referenced column = 1, OR = odds ratio, CI = confidence interval, LL = lower limit, UL = upper limit

Table 160. Results of binary logistic regression of targeted product consideration in empirical study 1

Appendix L Pretests for Empirical Study 2

L.1   Transparency Pretest 1

Objective. This pretest aims to design persuasion transparency information and preliminarily evaluate its impact on persuasion awareness. In PKM, persuasion knowledge is central to persuasion awareness. However, it might not be activated. As PKM predicts, "when a person begins conceiving of an agent's action, heretofore not identified as having any particular meaning, as a persuasion tactic a "change of meaning" will occur" (Friestad and Wright 1994, p. 13). In other words, the change-of-meaning principle helps enlighten individuals to recognize persuasion tactics used in agents' actions, thereby leading them to interpret those actions as persuasion attempts. In PKM, the authors gave an example of the similarity tactic used in a product presentation. If an individual is naive about this tactic, she will be less likely to interpret the similarities between those in the presentation and her as a persuasion attempt. That is, she attaches no particular meaning to that tactic. With the change of meaning that gives information concerning how similarities of the characteristics in the presentation work, she will be more likely to perceive that the presentation is trying to influence her. Following the change-of-meaning principle, I design persuasion transparency information to enhance users' perceived persuasion of an agent's suggestive content. Although users might be aware of some tactics used in online settings, there is no concrete investigation on this topic. Also, in the field, transparency information has been given. For example, Facebook provides page (agent) transparency information and information regarding a target of ads (persuasion target). However, no persuasion tactics information is implemented in the real world. Thus, I design persuasion transparency information based on the PKM's change-of-meaning principle to enhance users' perceived persuasion.

Transparency information manipulation. Williams et al. (2004) implemented the change of meaning by providing information regarding how the intention question influences individuals through the mere-measure effect. This information was presented as a research abstract and given to participants before they were exposed to the intention question. They found that providing this abstract to individuals moderated the impact of such question on their behaviors. Specifically, it increased their perceived persuasion, which, in turn, decreased targeted behaviors. Following their design, I develop persuasion transparency information to make the change of meaning process happen. Specifically, I adopt the three rules of persuasion from Cialdini (1983), namely, reciprocity, social proof, and scarcity, to explain how product recommendations, best-sellers, and low in stock, respectively, work to influence users. See Table 161 for detail.

Suggestive Content in Empirical Study 1	Persuasion Tactic (Cialdini 1983)	Persuasion Transparency Information
"Buy this item" "We recommend this"	Reciprocity	People tend to repay, in kind, recommendations websites have provided them. They would feel that the websites have done them a favor by offering valuable information to help them decide. So, they would feel grateful and accept those recommendations.
"Best-selling item"	Social proof	People tend to determine what is good based on what other people think is good. Usually, when a lot of others buy something, people feel that it is a good thing to buy. How can so many people be wrong? It must be worth purchasing.
"Low in stock"	Scarcity	People tend to think products are more valuable to them when their availability is limited. It is

Suggestive Content in Empirical Study 1	Persuasion Tactic (Cialdini 1983)	Persuasion Transparency Information
		enough to create a sense of urgency that makes people afraid to miss out on something. That is, if they do not buy it, they might miss out on a good thing.

Table 161. Suggestive content, persuasion tactic, and persuasion transparency information

To assess the effect of transparency information, I manipulate three levels: 1) no transparency serving as a control design, 2) non-persuasion information giving non-persuasion tactics information, and 3) persuasion transparency information featuring all three persuasion rules adapted from Cialdini (1983). Figure 92 depicts persuasion transparency manipulation in this pretest.

When shopping at e-commerce websites, please be aware that you may see things that are meant to influence you. Let's look at three common messages you might see on websites and how they work:

1. **Product recommendation**

People tend to repay, in kind, recommendations websites have provided them. They would feel that the websites have done them a favor by offering valuable information to help them decide. So, they would feel grateful and accept those recommendations.

2. **Best-sellers**

People tend to determine what is good based on what other people think is good. Usually, when a lot of others buy something, people feel that it is a good thing to buy. How can so many people be wrong? It must be worth purchasing.

3. **Low inventory**

People tend to think products are more valuable to them when their availability is limited. It is enough to create a sense of urgency that makes people afraid to miss out on something. That is, if they do not buy it, they might miss out on a good thing.

Figure 92. Persuasion transparency information manipulation in transparency pretest 1

Non-persuasion information or placebo is added to control for the effect of cognitive capacity. As prior research found, when individuals' cognitive capacity is limited, they are less likely to detect persuasion attempts. As persuasion transparency information requires users to spend their cognitive capacity, non-persuasion information with similar word counts (non-persuasion word counts = 168, persuasion transparency word counts = 178) is used to control for the cognitive capacity effect on persuasion awareness. In this pretest, non-persuasion information features how e-commerce websites should do during the pandemic. See Figure 93 for detail.

The pandemic is rapidly changing people's shopping behavior towards e-commerce websites. Now it is time for them to update their business to better meet people' needs. Let's look at three things websites should do:

1. **Social media**

Websites can take advantage of social media. Now is a good time to use social media to connect with their customers. Do not worry about what to post for the time being. Start linking social channels from websites and posting updates related to customer service.

2. **Updated content**

Websites get to make sure their content reflects updates. If extra volume is causing shipping delays, they should make sure that their order confirmation email mentions this. All relevant pages on websites should reflect any new policies.

3. **Customer service**

Now, more than ever, websites need to make sure they let people know how they serve their customers. Communication is key. Being clear about delays and even looking into new channels of communication to make sure websites reach their customers where they are.

Figure 93. Non-persuasion information manipulation in transparency pretest 1

Non-persuasion and persuasion transparency information are provided before users are exposed to the experimental website. Specifically, they are given at the end of the pre-questionnaire survey before participants read the website instructions and entered the website.

Suggestive content manipulation. As this pretest is an initial step, I implement only one suggestive content, "We recommend this," and no content as the control condition. They are the same design used in experiment 1 of empirical study 1. This allows me to focus more on the effect of persuasion transparency information.

Procedure and measurement. I follow the experimental procedure and the measurement used in experiment 1 of empirical study 1, and add transparency information manipulation, as well as the

scale to evaluate the effectiveness of transparency information manipulation. Specifically, I randomly assigned participants to six experimental conditions with two levels of claim content, "We recommend this," (absence vs. presence), and three groups of transparency information (no transparency, non-persuasion, and persuasion transparency). Table 162 shows the six experimental conditions in this pretest.

Condition	"We recommend this" (Claim)	Transparency Information
1	No	No transparency
2	No	Non-persuasion
3	No	Persuasion transparency
4	Yes	No transparency
5	Yes	Non-persuasion
6	Yes	Persuasion transparency

Table 162. Experimental conditions in transparency pretest 1

I followed empirical study 1's measures for suggestive design manipulation checks, persuasion awareness (perceived persuasive intent, perceived agent benefits, perceived assistive intent, and perceived user benefits), and three types of user knowledge (agent domain, persuasion, and topic). Additionally, I developed one scale to evaluate the effectiveness of transparency information manipulation, called perceived availability of persuasion transparency information. See Table 163 for detail.

Item Name	Item	Scale/Source
Please evaluate [agent name] in the following aspects:		Seven-point semantic differential scale
Perceived availability of persuasion transparency information		

Item Name	Item	Scale/Source
APT1	I did not learn about how specific things appeared on e-commerce websites work. – I learned about how specific things appeared on e-commerce websites work.	Newly developed
APT2	I did not learn that e-commerce websites apply some gimmicks. – I learned that e-commerce websites apply some gimmicks.	Newly developed
APT3_R	I learned about common things e-commerce websites feature. – I did not learn about common things e-commerce websites feature. (R)	Newly developed

Note: R = reversed item

Table 163. Measurement for persuasion transparency information manipulation check

Participant background information. The 60 participants were recruited from Prolific. Participants who 1) used incorrect usernames to log in to the website, 2) selected more than one product, 3) used a mobile device to access the website, 4) spent less than one minute on the website task, and 5) failed attention checks were removed. This results in a usable sample size of 51 for analyses.

Results on user knowledge. A two-way ANOVA was performed to evaluate the effect of claim content ("We recommend this"), transparency information, and their interaction on the three types of knowledge. The statistics are reported in Table 136. Results showed that a significant effect of persuasion transparency information on e-commerce knowledge with a large effect size. Follow-up tests using a Bonferroni correction revealed that those with persuasion transparency had significantly higher e-commerce knowledge than those with no transparency, $p = .03$, and those with non-persuasion information had marginally significantly higher e-commerce knowledge than those with no transparency, $p = .07$. Also, there was a significant claim x persuasion transparency interaction with a large effect size was found. Follow-up tests using a Bonferroni demonstrated

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that those with non-persuasion information, in the absence of claim, had significantly higher persuasion knowledge than those with no transparency, $p = .01$, and marginally significantly higher than those with persuasion transparency, $p = .06$. Therefore, participants differed in perceived e-commerce and general persuasion knowledge. No other significant differences were found.

In the following analyses, a two-way ANOVA was performed with claim, persuasion transparency information, and their interaction. The computed scores of each construct were averaged.

Measure	Suggestive Content			Transparency Information			Suggestive Content x Transparency Information		
	$F(1, 45)$	p	η_p^2	$F(2, 45)$	p	η_p^2	$F(2, 45)$	p	η_p^2
User knowledge									
Agent domain (e-commerce) knowledge	0.00	.95	.00	4.62	.02	.17	0.68	.51	.03
Persuasion (general) knowledge	1.02	.32	.02	1.91	.16	.08	4.66	.01	.17
Topic (product) knowledge	1.59	.21	.03	.27	.77	.01	.80	.46	.03

Table 164. Two-way ANOVAs in user knowledge in transparency pretest 1

Manipulation check on perceived suggestive design. The Cronbach's alpha for Perceived Suggestive Design was 0.70, indicating sufficient internal consistency reliability. The means and standard deviations are reported in Table 178. The statistics are summarized in Table 179. Results from a two-way ANOVA revealed that a significant impact of claim was found with a large effect size. Consistent with my expectation, the presence of claim content was significantly more suggestive than the absence of claim content. No other significant effects were found. Therefore, the manipulation of claim content was successful. Figure 94 depicts the difference in perceived suggestive design between the suggestive and the persuasion transparency information conditions.

Suggestive Content Manipulation	Transparency Information	Mean	Standard Deviation
No claim	No transparency	2.93	1.45
	Non-persuasion information	3.20	1.45
	Persuasion transparency	2.56	1.03
	Total	2.85	1.27
Claim	No transparency	5.17	1.53
	Non-persuasion information	5.13	1.25
	Persuasion transparency	4.93	1.58
	Total	5.07	1.42
Total	No transparency	4.05	1.85
	Non-persuasion information	4.38	1.60
	Persuasion transparency	3.74	1.78
	Total	4.03	1.75

Table 165. Means and standard deviations of perceived suggestive design in transparency pretest 1

Effect	F	p	η_p^2
Suggestive content	29.29[a]	.00	.39
Transparency information	0.39[b]	.68	.02

Effect	F	p	η_p^2
Suggestive content x transparency information	0.09^b	.91	.00

Note: [a] $F(1, 45)$, [b] $F(2, 45)$

Table 166. Two-way ANOVA in perceived suggestive design in transparency pretest 1

Figure 94. The difference in perceived suggestive design between the suggestive content and the transparency information condition in transparency pretest 1

Manipulation check on perceived availability of persuasion transparency information. The Cronbach's alpha for this measure was 0.51, after a reversed item (APT3_R) was removed. Due to the low reliability, I did not evaluate the effectiveness of persuasion transparency manipulation using this measure.

Results on perceived persuasive intent. The Cronbach's alpha for the Perceived Persuasive Intent scale was 0.86, indicating sufficient internal consistency reliability. Table 167 and Table 168 present the means and standard deviations and the statistics. Results from a two-way ANOVA indicated that only the presence of claim content significantly increased perceived persuasive intent with a large effect size. Although persuasion transparency did not significantly influence

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perceived persuasive intent, a medium effect size suggested that there might be a significant difference. Thus, in line with empirical study 1, the presence of a claim significantly increased perceived persuasive intent. Also, persuasion transparency might affect perceived persuasive intent. See Figure 95 for the difference in perceived persuasive intent.

Suggestive Content Manipulation	Transparency Information	Mean	Standard Deviation
No claim	No transparency	2.60	1.16
	Non-persuasion information	2.20	0.45
	Persuasion transparency	2.93	1.36
	Total	2.64	1.13
Claim	No transparency	4.03	1.61
	Non-persuasion information	3.83	1.10
	Persuasion transparency	4.63	1.51
	Total	4.17	1.43
Total	No transparency	3.32	1.55
	Non-persuasion information	3.21	1.21
	Persuasion transparency	3.78	1.65
	Total	3.45	1.50

Table 167. Means and standard deviations of perceived persuasive intent in transparency pretest 1

Effect	F	p	η_p^2
Suggestive content	17.62[a]	.00	.28
Transparency information	1.31[b]	.28	.06
Suggestive content x transparency information	0.05[b]	.95	.00

Note: [a] $F(1, 45)$, [b] $F(2, 45)$

Table 168. Two-way ANOVA in perceived persuasive intent in transparency pretest 1

Figure 95. The difference in perceived persuasive intent between the suggestive content and the transparency information condition in transparency pretest 1

Results on perceived agent benefits. The Cronbach's alpha for the Perceived Persuasive Intent scale was 0.72, suggesting sufficient internal consistency reliability. Table 169 and Table 170 show the means and standard deviations and the statistics. Results from a two-way ANOVA informed that only the claim content condition significantly increased perceived agent benefits with a large effect size. Nonetheless, the effect size of .05 of a claim x persuasion transparency suggested that there might be a significant interaction. Therefore, aligning with empirical study 1, the presence of claim content significantly enhanced perceived agent benefits. Also, there might be a significant claim x persuasion transparency interaction. Figure 96 displays the difference in perceived agent benefits.

Suggestive Content Manipulation	Transparency Information	Mean	Standard Deviation
No claim	No transparency	2.73	1.29
	Non-persuasion information	3.27	0.92

Suggestive Content Manipulation	Transparency Information	Mean	Standard Deviation
	Persuasion transparency	3.30	1.25
	Total	3.06	1.19
Claim	No transparency	4.77	1.07
	Non-persuasion information	3.92	1.44
	Persuasion transparency	4.56	1.33
	Total	4.44	1.28
Total	No transparency	3.75	1.56
	Non-persuasion information	3.67	1.27
	Persuasion transparency	3.93	1.41
	Total	3.79	1.41

Table 169. Means and standard deviations of perceived agent benefits in transparency pretest 1

Effect	F	p	η_p^2
Suggestive content	13.35[a]	.00	.23
Transparency information	0.27[b]	.77	.01
Suggestive content x transparency information	1.23[b]	.30	.05

Note: [a] $F(1, 45)$, [b] $F(2, 45)$

Table 170. Two-way ANOVA in perceived agent benefits in transparency pretest 1
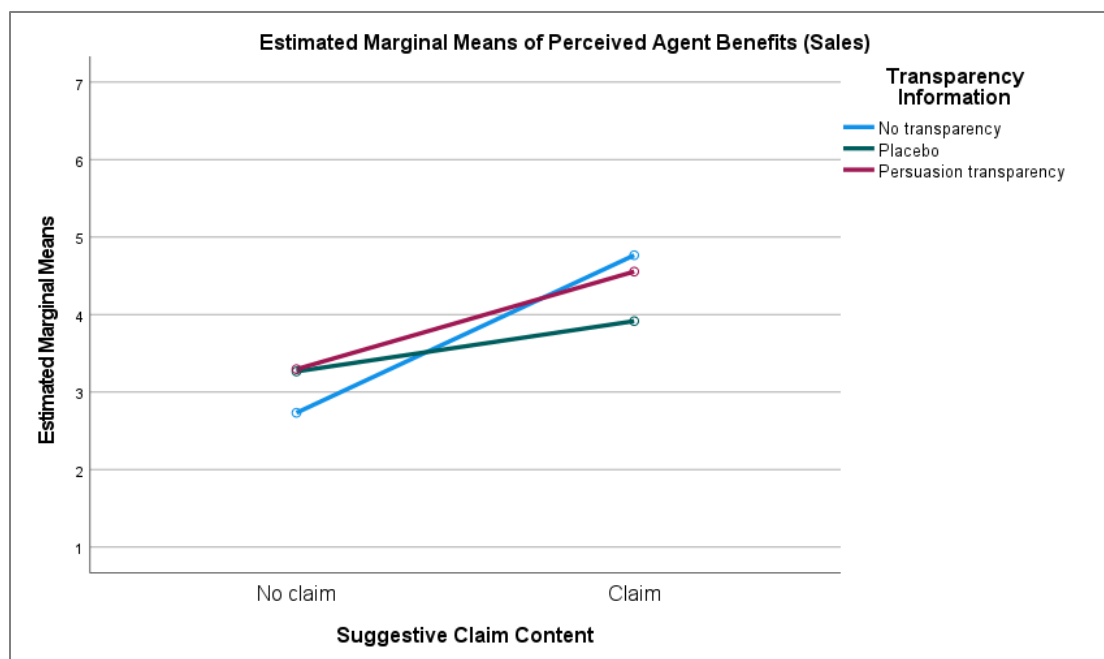
Figure 96. The difference in perceived agent benefits (sales) between the suggestive content and the transparency information condition in transparency pretest 1

Results on perceived assistive intent. The Cronbach's alpha for the Perceived Assistive Intent scale was 0.77, indicating sufficient internal consistency reliability. The means and standard deviations appear in Table 171. The statistics are reported in Table 172. Results from a two-way ANOVA showed that there were no significant effects of claim content, persuasion transparency, and claim x persuasion transparency interaction. However, a medium effect size of persuasion transparency information suggested that there might be an impact of persuasion transparency. Also, a relatively medium effect size of persuasion transparency indicated a possible interaction effect. Thus, persuasion transparency might lead to perceived assistive intent. The difference in perceived assistive intent is depicted in Figure 97.

Suggestive Content Manipulation	Transparency Information	Mean	Standard Deviation
No claim	No transparency	4.20	1.12
	Non-persuasion information	5.47	0.99

Suggestive Content Manipulation	Transparency Information	Mean	Standard Deviation
	Persuasion transparency	4.48	1.13
	Total	4.57	1.16
Claim	No transparency	4.60	1.57
	Non-persuasion information	4.58	0.90
	Persuasion transparency	4.19	0.67
	Total	4.46	1.12
Total	No transparency	4.40	1.34
	Non-persuasion information	4.92	1.00
	Persuasion transparency	4.33	0.91
	Total	4.51	1.13

Table 171. Means and standard deviations of perceived assistive intent in transparency pretest 1

Effect	F	p	η_p^2
Suggestive content	0.64[a]	.43	.01
Transparency information	1.60[b]	.21	.07
Suggestive content x transparency information	1.29[b]	.29	.05

Note: [a] $F(1, 45)$, [b] $F(2, 45)$

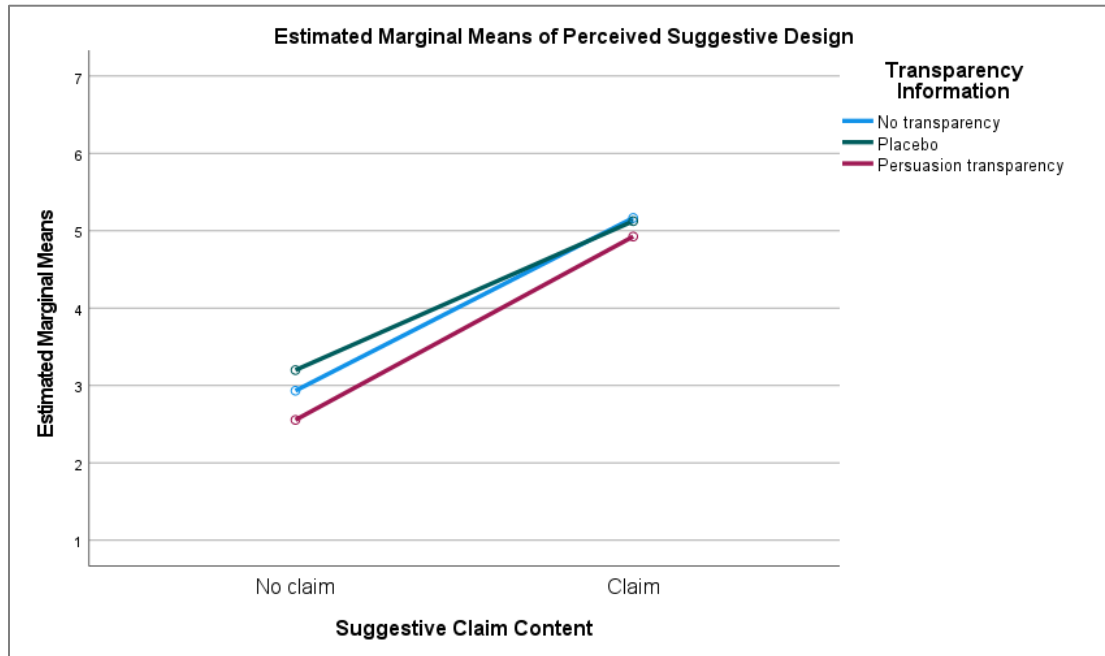**Table 172. Two-way ANOVA in perceived assistive intent in transparency pretest 1**
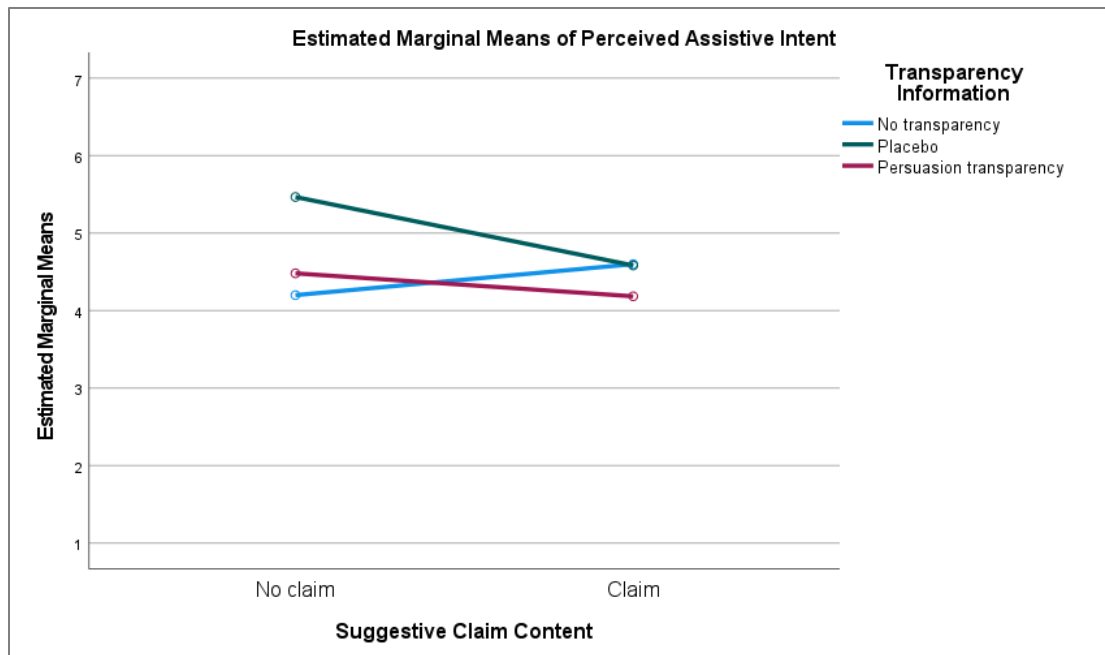
Figure 97. The difference in perceived assistive intent between the suggestive content and the transparency information condition in transparency pretest 1

Results on perceived user benefits. The Cronbach's alpha for the Perceived User Benefits scale was 0.77, suggesting sufficient internal consistency reliability. The means and standard deviations are presented in Table 173. The statistics are detailed in Table 174. A two-way ANOVA was conducted. Results demonstrated that no significant impact of claim, persuasion transparency, and claim x persuasion transparency were found. Nevertheless, there was a relatively medium effect size of persuasion transparency. This pointed out the possible persuasion transparency effect. Thus, persuasion transparency might influence perceived user benefits. Figure 98 depicts the difference in perceived user benefits.

Suggestive Content Manipulation	Transparency Information	Mean	Standard Deviation
No claim	No transparency	4.67	1.09
	Non-persuasion information	5.67	0.94
	Persuasion transparency	4.81	0.85

Suggestive Content Manipulation	Transparency Information	Mean	Standard Deviation
	Total	4.93	1.01
Claim	No transparency	5.03	1.49
	Non-persuasion information	5.00	0.82
	Persuasion transparency	4.74	1.10
	Total	4.93	1.16
Total	No transparency	4.85	1.28
	Non-persuasion information	5.26	0.89
	Persuasion transparency	4.78	0.96
	Total	4.93	1.08

Table 173. Means and standard deviations of perceived user benefits in transparency pretest 1

Effect	F	p	η_p^2
Suggestive content	0.16[a]	.70	.00
Transparency information	1.05[b]	.36	.05
Suggestive content x transparency information	0.85[b]	.44	.04

Note: [a] $F(1, 45)$, [b] $F(2, 45)$

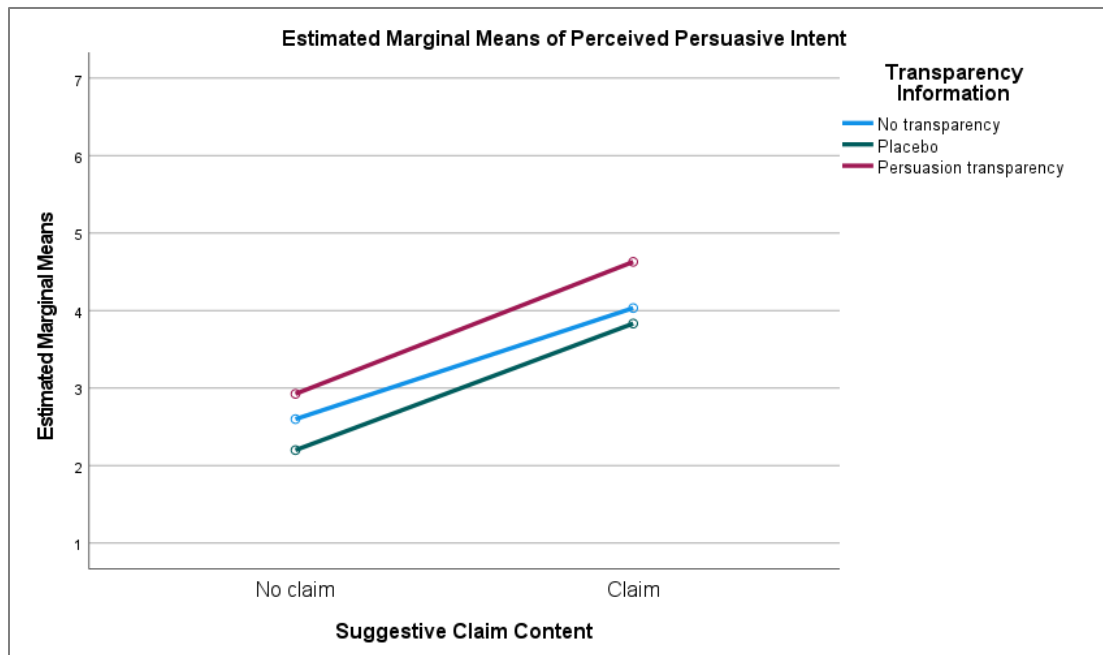**Table 174. Two-way ANOVA in perceived user benefits in transparency pretest 1**
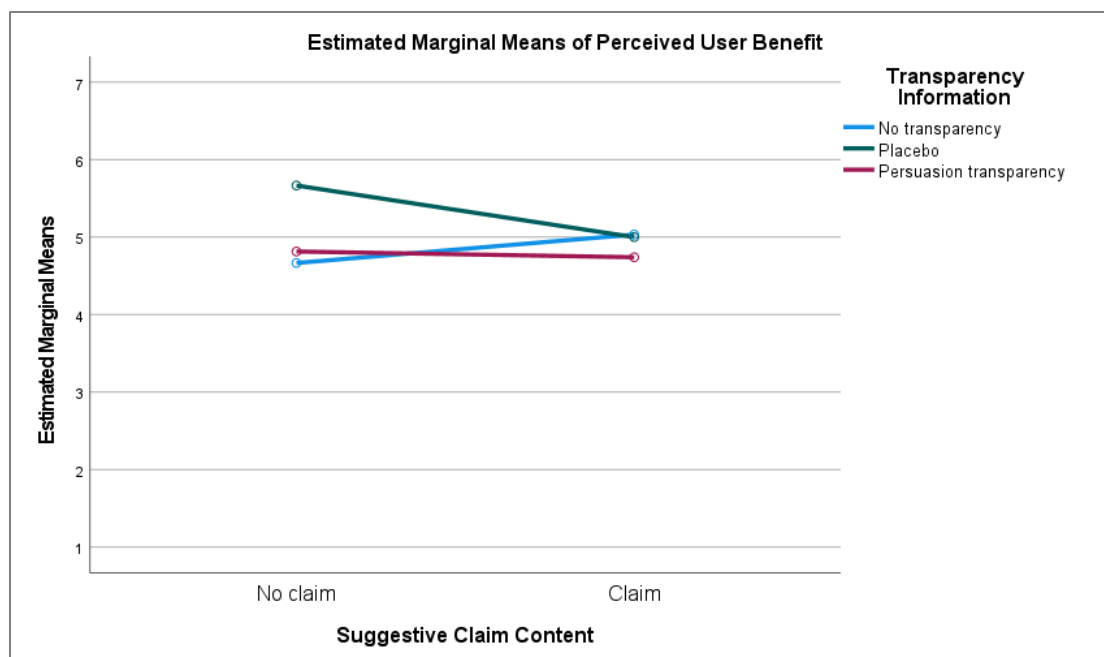
Figure 98. The difference in perceived user benefits between the suggestive content and the transparency information condition in transparency pretest 1

Conclusion. Suggestive content, specifically a claim, significantly increased perceived persuasive intent and perceived agent benefits. Despite being non-significant, persuasion transparency with a medium effect size suggests its impact on perceived persuasion and assistance. It appears that persuasion transparency might influence perceived persuasion. Thus, increasing the sample size would increase the statistical power in detecting the true differences. Also, the low reliability of perceived availability of persuasion transparency would have been improved if the sample size increased. Thus, in the next pretest (L.2 transparency pretest 2), I increased the sample size from 10 per experimental conditions to 20.

L.2   Transparency Pretest 2

Objective. In the transparency pretest 1, non-persuasion information presented information regarding three things e-commerce websites should do to deal with the pandemic. It increased users' agent domain knowledge. Thus, this kind of information is not appropriate for the non-

persuasion or placebo design. In this pretest, the university information (the University of British Columbia) was used for non-persuasion information. Specifically, it provided information about the university's credentials, visions, and values. See Figure 99 for detail. Also, the transparency pretest 1 employed three persuasion rules from Cialdini (1983) without warning messages for persuasion transparency. This might explain why persuasion transparency did not significantly influence users' persuasion awareness—perceived persuasion and perceived assistance. Consequently, a warning statement was added to each rule in this pretest. In the product recommendation rule, users were warned that the product recommendations might not be the best fit for them. As a warning for the best-sellers rule, users were reminded that they might not like the best-sellers if they are not similar to others. In the low inventory rule, users were notified that the product with low inventory might not be the thing they want. See Figure 100 for more detail. Following the transparency pretest 1, no information was implemented for the control persuasion transparency information. Additionally, one additional suggestive content, "best-seller item" was manipulated in this pretest. This allows me to evaluate whether there are differences between different suggestive contents and different types of persuasion transparency information.

The University of British Columbia (UBC) is a global centre for teaching, learning and research, consistently ranked among the top 20 public universities in the world and recently recognized as North America's most international university.

Since 1915, our motto, Tuum Est (It is Yours), has been a declaration of our commitment to attracting and supporting those who have the drive to shape a better world. As a result, UBC students, faculty and staff continue to embrace innovation and challenge the status quo, placing us at the forefront of discovery, learning and engagement. UBC encourages bold thinking, curiosity and initiative, so you can realize your greatest potential.

UBC creates an exceptional learning environment that fosters global citizenship, advances a civil and sustainable society, and supports outstanding research to serve the people of British Columbia, Canada and the world.

As one of the world's top research universities, UBC has created positive change at home and abroad for more than a century. Today our two major campuses—in Vancouver and the Okanagan—attract, nurture and transform more than 65,000 students from Canada and 140+ countries around the world. Also, UBC's Asia Pacific Regional Office in Hong Kong and Liaison Office in New Delhi, India, facilitate teaching and research partnerships and support alumni engagement.

Figure 99. Non-persuasion information in transparency pretest 2

When shopping at e-commerce websites, please be aware that you may see things that are meant to influence you. Let's look at three common messages you might see on websites and how they work:

1. **Product recommendation**

People tend to repay, in kind, recommendations websites have provided them. They would feel that the websites have done them a favor by offering valuable information to help them decide. So, they would feel grateful and buy recommended ones. However, the recommendations might not be the best fit for them.

2. **Best-sellers**

People tend to determine what is good based on what other people think is good. Usually, when a lot of others buy something, people feel that it is a good thing to buy. How can so many people be wrong? It must be worth purchasing. However, if they are not similar to others, they might not like it.

3. **Low inventory**

People tend to think products are more valuable to them when their availability is limited. It is enough to create a sense of urgency that makes people afraid to miss out on something. That is, if they do not buy it, they might miss out on a good thing. However, it might not be the thing they want.

Figure 100. Persuasion transparency in transparency pretest 2

Procedure and measurement. I followed the experimental procedure and measurement used in the transparency pretest 1. Like the transparency pretest 1, this pretest randomly assigned participants to one of three suggestive content conditions: 1) no content, 2) claim content = "we recommend this," 3) data content = "best-selling item." Also, I randomly assigned participants to see one of the three types of transparency information: 1) no transparency, 2) non-persuasion, and 3) persuasion transparency. This results in 9 experimental conditions, shown in Table 175.

Suggestive Content	Suggestive Content Manipulation	Transparency Information		
		No Transparency	Non-persuasion	Persuasion Transparency
Control	No content	1	2	3

Suggestive Content	Suggestive Content Manipulation	Transparency Information		
		No Transparency	Non-persuasion	Persuasion Transparency
Claim	We recommend this	4	5	6
Data	Best-selling item	7	8	9

Table 175. Suggestive content and transparency information manipulations in transparency pretest 2

Participant background information. The 180 participants were recruited from Prolific. Two participant who did not complete the post-questionnaire survey were removed. Two participants who used incorrect username were removed. One participant who selected more than one product was removed. Two participants who used a mobile device were removed. All participants spent more than one minute on the website. 42 participants did not have GA tracked information. Eight participants who failed attention check questions were excluded form analyses. As a result, there were 165 usable sample, with 125 with GA information.

Chi-square tests were conducted to assess the differences among the conditions. See Table 176 for the detailed statistics. Results revealed that there was no significant difference in age, marital, and condition across all conditions. However, a significant difference in gender, and a marginally significant difference in income were found across the conditions. Note that more 50% of cells had expected count less than 5. Therefore, these results might be invalid. Although the conditions significantly differed in terms of gender and income, follow-up Z tests using a Bonferroni correction indicated that there were no significant differences between the conditions, $p > .05$. Also, they did not influence other variables. Hence, they were excluded from further analyses.

Measure	χ^2	df	p
Age	37.88[a]	40	.57
Marital status	18.90[a]	24	.76

Measure	χ^2	df	p
Education	55.44[a]	56	.50
Gender	36.08[a]	24	.05
Income	73.83[a]	56	.06

Note: [a] Expected count less than 5

Table 176. Chi-square tests comparing the nine conditions in terms of demographics in transparency pretest 2

Results on control variables. Three types of user knowledge serve as control variables. A two-way ANOVA was performed to evaluate the effect of suggestive content, transparency information, and their interaction on the three types of knowledge. The statistics are reported in Table 177. Results indicated that no significant difference in users' agent knowledge was found (a small effect size). However, results pointed out that there was a significant effect of transparency information on general persuasion knowledge (a small effect size). No other significant effects were found (a small effect size). Follow-up tests using a Bonferroni correction were conducted. Results suggested that those with persuasion transparency had a significantly higher persuasion knowledge than those with non-persuasion information, $p = .04$, and a marginally significantly higher persuasion knowledge than those with no transparency, $p = .09$. In other words, participants assigned to persuasion transparency had higher persuasion knowledge than other transparency information conditions. Lastly, results showed that the suggestive condition had a significant impact on product knowledge (a small effect size), while there were no other effects (a small effect size). Follow-up tests using a Bonferroni correction were performed. Results demonstrated that those in the "We recommend this" content had a significantly lower product knowledge than those in the "Best-selling item" condition. As a result, persuasion and product knowledge were used as covariates in persuasion awareness analysis.

Measure	Suggestive Content			Transparency Information			Suggestive Content x Transparency Information		
	$F(2, 156)$	p	η_p^2	$F(2, 156)$	p	η_p^2	$F(4, 156)$	p	η_p^2
User knowledge									
Agent domain (e-commerce) knowledge	0.52	.60	.01	1.96	.14	.03	1.13	.35	.03
Persuasion (general) knowledge	2.06	.13	.03	3.73	.03	.05	1.21	.31	.03
Topic (product) knowledge	4.06	.02	.05	.43	.65	.01	1.13	.34	.03

Table 177. Two-way ANOVAs in control variables in transparency pretest 2

Suggestive manipulation checks. The Cronbach's alpha for the Perceived Suggestive Design was 0.72, suggesting sufficient internal consistency reliability. A two-way ANOVA with suggestive content and transparency information was performed. The means and standard deviations are reported in Table 178. Table 179 presents the statistics. Results from a two-way ANOVA showed a significant impact of suggestive content manipulations with a large effect size. Transparency information manipulation and the suggestive content x transparency information interaction did not significantly influence perceived suggestive design. Results from follow-up tests using a Bonferroni correction revealed that "We recommend this" was more suggestive than the control, $p < .001$, and "Best-selling item", $p = .01$. Also, "Best-selling item" was more suggestive than the control, $p = .01$. Thus, the manipulation of suggestive content successfully reflected the suggestive design. See Figure 101 for the difference in perceived suggestive design between the suggestive content and the transparency information condition.

Suggestive Content Manipulation	Transparency Information	Mean	Standard Deviation
Control (no content)	No transparency	2.59	1.36
	Non-persuasion	3.57	1.58
	Persuasion transparency	3.02	1.45
	Total	3.06	1.49
We recommend this	No transparency	4.74	1.50
	Non-persuasion	4.19	1.77
	Persuasion transparency	4.97	1.41
	Total	4.66	1.56
Best-selling item	No transparency	3.33	1.50
	Non-persuasion	3.85	1.42
	Persuasion transparency	4.14	1.74

Suggestive Content Manipulation	Transparency Information	Mean	Standard Deviation
	Total	3.75	1.56
Total	No transparency	3.57	1.68
	Non-persuasion	3.86	1.57
	Persuasion transparency	4.09	1.71
	Total	3.83	1.66

Table 178. Means and standard deviations of perceived suggestive design in transparency pretest 2

Effect	F	p	η_p^2
Suggestive content	14.28[a]	.00	.16
Transparency information	1.46[a]	.24	.02
Suggestive content x transparency information	1.45[b]	.22	.04

Note: [a] $F(2, 156)$, [b] $F(4, 156)$

Table 179. Two-way ANOVA in perceived suggestive design in transparency pretest 2

Figure 101. The difference in perceived suggestive design between the suggestive content and the transparency information condition in transparency pretest 2

Informative design manipulation check. The Cronbach's alpha for the Perceived Informative Design was 0.78, indicating sufficient internal consistency reliability. Table 180 presents the means and standard deviations. The statistics appear in Table 181. Results from a two-way

ANOVA showed that no effects were found with a small effect size. Inconsistent with my expectation, the "best-selling" manipulation did not significantly induce perceived informative design. Also, persuasion transparency did not significantly stimulate perceived informative design. Figure 102 presents the difference in perceived informative design between the suggestive content and the transparency condition.

Suggestive Content Manipulation	Transparency Information	Mean	Standard Deviation
Control (no content)	No transparency	5.41	1.39
	Non-persuasion	6.00	1.03
	Persuasion transparency	5.55	1.21
	Total	5.65	1.22
We recommend this	No transparency	5.54	1.19
	Non-persuasion	5.15	1.40
	Persuasion transparency	6.12	0.86
	Total	5.64	1.20
Best-selling item	No transparency	5.62	1.05
	Non-persuasion	6.00	1.20
	Persuasion transparency	6.12	1.05
	Total	5.90	1.11
Total	No transparency	5.53	1.19
	Non-persuasion	5.75	1.25
	Persuasion transparency	5.94	1.05
	Total	5.73	1.17

Table 180. Means and standard deviations of perceived informative design in transparency pretest 2

Effect	F	p	η_p^2
Suggestive content	1.15[a]	.32	.01
Transparency information	1.69[a]	.19	.02

Effect	F	p	η_p^2
Suggestive content x transparency information	1.82^b	.13	.04

Note: $^a F(2, 156)$, $^b F(4, 156)$

Table 181. Two-way ANOVA in perceived informative design in transparency pretest 2

Figure 102. The difference in perceived informative design between the suggestive content and the transparency information condition in transparency pretest 2

Availability of persuasion transparency information manipulation. The Cronbach's alpha for the Perceived Availability of Persuasion Transparency Information scale was 0.70 after the APT2 item was removed, indicating sufficient internal consistency reliability. The means and standard deviations, and the statistics are reported in Table 182 and Table 183, respectively. Results from a two-way ANOVA revealed that only a suggestive content x transparency information significantly influenced perceived availability of persuasion transparency information with a medium effect size. Follow-up tests using a Bonferroni correction showed that persuasion transparency, in the presence of "Best-selling item," led to a significantly higher degree of perceived availability than no transparency, $p = .01$, and marginally significantly higher level of this perception than non-persuasion information, $p = .07$. This suggests that providing those in the "Best-selling item" with

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persuasion transparency information successfully made them aware of persuasion transparency information. No other differences were found. Thus, this manipulation was relatively successful. Figure 103 presents the difference in perceived persuasion transparency information availability.

Suggestive Content Manipulation	Transparency Information	Mean	Standard Deviation
Control (no content)	No transparency	4.61	1.28
	Non-persuasion	4.83	1.77
	Persuasion transparency	4.62	1.88
	Total	4.69	1.63
We recommend this	No transparency	5.03	1.15
	Non-persuasion	3.97	1.47
	Persuasion transparency	4.78	1.48
	Total	4.63	1.41
Best-selling item	No transparency	4.25	1.67
	Non-persuasion	4.55	1.44
	Persuasion transparency	5.68	1.00
	Total	4.78	1.52
Total	No transparency	4.62	1.41
	Non-persuasion	4.47	1.57
	Persuasion transparency	5.01	1.54
	Total	4.70	1.51

Table 182. Means and standard deviations of perceived availability of persuasion transparency in transparency pretest 2

Effect	F	p	η_p^2
Suggestive content	0.35[a]	.70	.01
Transparency information	2.09[a]	.13	.03
Suggestive content x transparency information	2.58[b]	.04	.06

Note: [a] $F(2, 156)$, [b] $F(4, 156)$

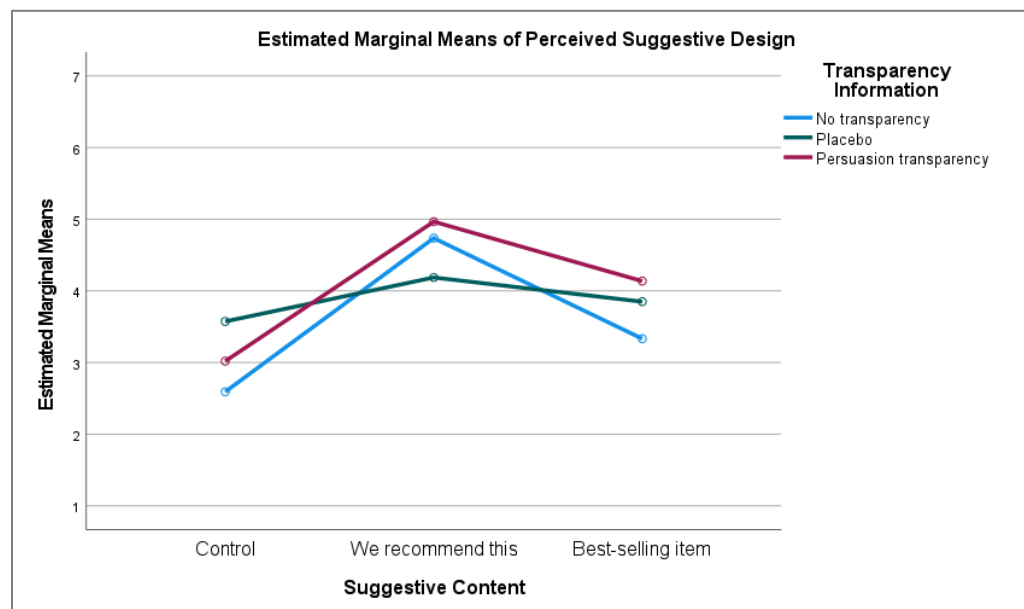**Table 183. Two-way ANOVA in perceived suggestive design in transparency pretest 2**
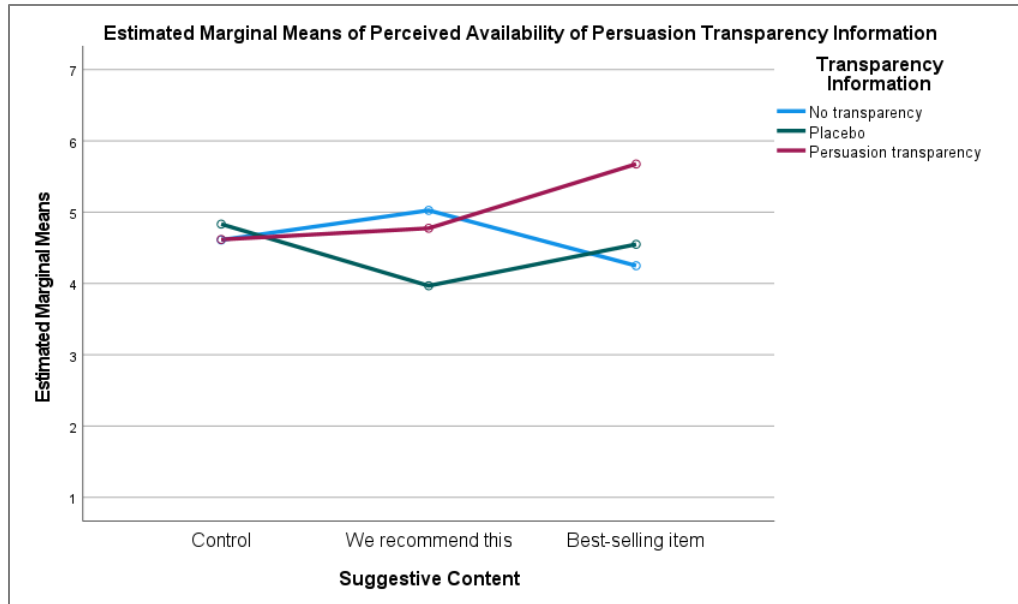
Figure 103. The difference in perceived availability of persuasion transparency between the suggestive content and the transparency information condition in transparency pretest 2

As this is a pretest, I focused on how the manipulations (suggestive content and transparency information), together with general persuasion and product knowledge (covariates), affected each dimension of perceived persuasion and perceived assistance. Thus, I analyzed persuasion awareness in terms of the low-level constructs, perceived persuasive intent, perceived agent benefits, perceived assistive intent, and perceived user benefits, separately.

Results on perceived persuasive intent. The Cronbach's alpha for the Perceived Persuasive Intent scale was 0.78, indicating sufficient internal consistency reliability. A two-way ANOVA with general persuasion and topic (product) knowledge as covariates was performed. The means and standard deviations, and the statistics appear, respectively, in Table 184 and Table 185. Results demonstrated that only suggestive content significantly influenced perceived persuasive intent with a medium effect size. No other effects were found. Follow-up tests using a Bonferroni correction showed that "We recommend this" significantly resulted in higher perceived persuasive intent than the no content condition, $p < .001$. There were no other significant differences. Figure

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104 depicts the difference in perceived persuasive intent, after controlling for the two covariates, between the suggestive and the transparency information condition.

Suggestive Content Manipulation	Transparency Information	Mean	Standard Deviation
Control (no content)	No transparency	4.61	1.28
	Non-persuasion	4.83	1.77
	Persuasion transparency	4.62	1.88
	Total	4.69	1.63
We recommend this	No transparency	5.03	1.15
	Non-persuasion	3.97	1.47
	Persuasion transparency	4.78	1.48
	Total	4.63	1.41
Best-selling item	No transparency	4.25	1.67
	Non-persuasion	4.55	1.44
	Persuasion transparency	5.68	1.00
	Total	4.78	1.52
Total	No transparency	4.62	1.41
	Non-persuasion	4.47	1.57
	Persuasion transparency	5.01	1.54
	Total	4.70	1.51

Table 184. Means and standard deviations of perceived persuasive intent in transparency pretest 2

Effect	F	p	η_p^2
Suggestive content	6.39[a]	.00	.08
Transparency information	1.12[a]	.33	.01
Suggestive content x transparency information	0.13[b]	.97	.00
Persuasion (general) knowledge	0.88[c]	.35	.01
Topic (product) knowledge	0.11[c]	.74	.00

Note: [a] $F(2, 154)$, [b] $F(4, 154)$, [c] $F(1, 154)$, persuasion and topic knowledge as covariates

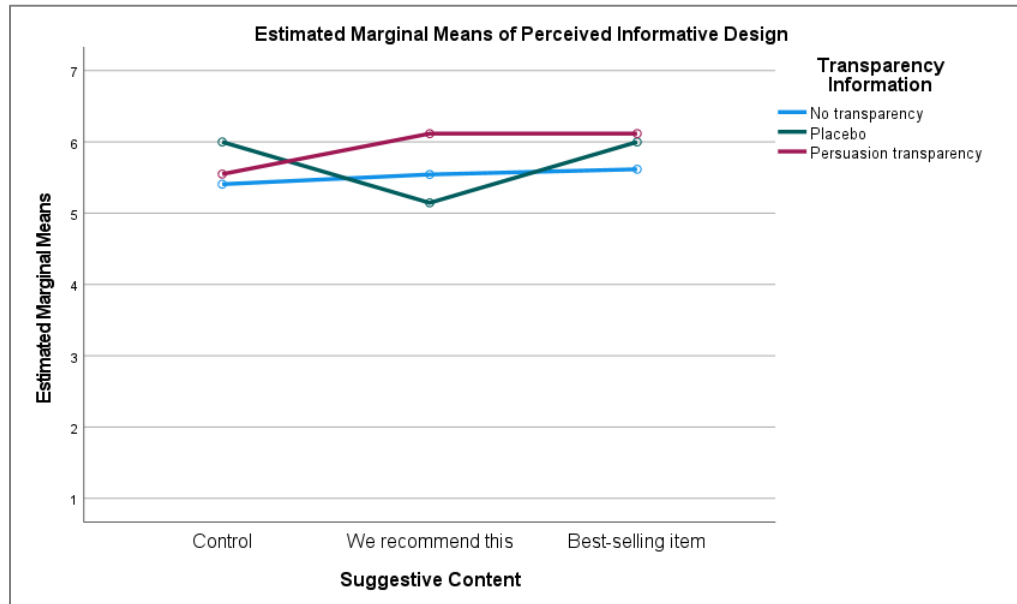**Table 185. Two-way ANOVA in perceived persuasive intent in transparency pretest 2**

Figure 104. The difference in perceived persuasive intent between the suggestive content and the transparency information condition in transparency pretest 2

Results on perceived agent benefits. The Cronbach's alpha for the Perceived Agent Benefits scale was 0.66. Although it was lower than 0.7, its internal consistency reliability was acceptable. A two-way ANOVA with general persuasion knowledge and topic knowledge as covariates was conducted. Table 186 and Table 187 present the means and standard deviations, and the statistics, respectively. In line with results on perceived persuasive intent, results from this analysis showed that only suggestive content significantly affected perceived agent benefits with a small effect size. Follow-test using a Bonferroni correction revealed that "We recommend this" increased perceived agent benefits than the no content, $p = .01$. There were no other significant differences. Figure 105 depicts the difference in perceived agent benefits between the suggestive content and the transparency information condition after controlling for general persuasion and topic knowledge.

Suggestive Content Manipulation	Transparency Information	Mean	Standard Deviation
Control (no content)	No transparency	3.50	1.43

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Suggestive Content Manipulation	Transparency Information	Mean	Standard Deviation
	Non-persuasion	3.89	1.32
	Persuasion transparency	3.67	1.33
	Total	3.69	1.35
We recommend this	No transparency	4.37	1.07
	Non-persuasion	4.15	1.24
	Persuasion transparency	4.75	1.32
	Total	4.44	1.22
Best-selling item	No transparency	3.80	1.48
	Non-persuasion	3.70	1.21
	Persuasion transparency	4.35	1.49
	Total	3.93	1.40
Total	No transparency	3.89	1.36
	Non-persuasion	3.90	1.25
	Persuasion transparency	4.28	1.43
	Total	4.02	1.35

Table 186. Means and standard deviations of perceived agent benefits in transparency pretest 2

Effect	F	p	η_p^2
Suggestive content	4.33[a]	.02	.05
Transparency information	1.04[a]	.36	.01
Suggestive content x transparency information	0.59[b]	.67	.02
Persuasion (general) knowledge	0.29[c]	.59	.00
Topic (product) knowledge	0.05[c]	.82	.00

Note: [a] $F(2, 154)$, [b] $F(4, 154)$, [c] $F(1, 154)$, persuasion and topic knowledge as covariates

Table 187. Two-way ANOVA in perceived agent benefits in transparency pretest 2
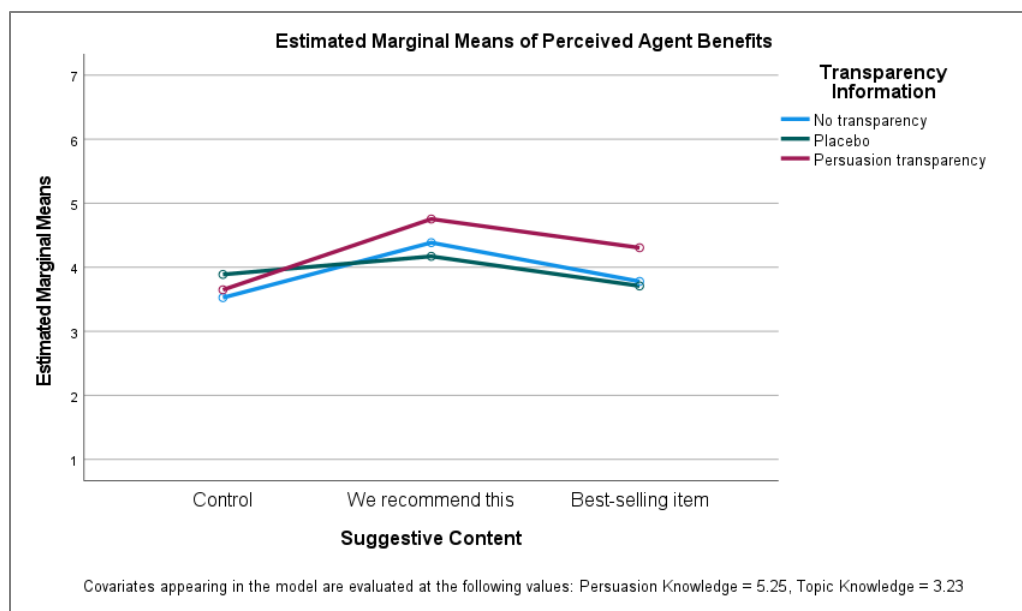
Figure 105. Means and standard deviations of perceived agent benefits in transparency pretest 2

Results on perceived assistive intent. The Cronbach's alpha for the Perceived Assistive Intent scale was 0.83, suggesting sufficient internal consistency reliability. I performed a two-way ANOVA with general persuasion and topic knowledge as covariates. The means and standard deviations, and the statistics are summarized in Table 188 and Table 189. Results showed that topic knowledge had a significant impact on perceived assistive intent with a small effect size. After controlling for users' topic knowledge, there was a marginally significant interaction effect between suggestive content and transparency information with a small effect size. Follow-up tests using a Bonferroni correction was conducted. Results indicated that, only in the presence of "Best-selling item," persuasion transparency led to higher perceived assistive intent than no transparency, $p = .04$. However, persuasion transparency did not take any effect of "We recommend this." The reason might be the fact that individuals generally understand why "We recommend this" works for influence. In contrast, they might not know well about how "Best-selling item" influenced them. Consequently, providing persuasion transparency for those seeing "Best-selling item" added perceived assistive intent, while giving it for those in the "We recommend this" did not do so.

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Figure 106 displays the difference in perceived assistive intent after controlling for persuasion and topic knowledge between the suggestive and the transparency information condition.

Suggestive Content Manipulation	Transparency Information	Mean	Standard Deviation
Control (no content)	No transparency	4.41	1.16
	Non-persuasion	4.89	1.14
	Persuasion transparency	4.67	1.14
	Total	4.65	1.14
We recommend this	No transparency	5.07	0.73
	Non-persuasion	4.23	1.29
	Persuasion transparency	4.90	1.19
	Total	4.76	1.12
Best-selling item	No transparency	4.15	1.42
	Non-persuasion	4.57	1.11
	Persuasion transparency	5.27	1.43
	Total	4.63	1.38
Total	No transparency	4.54	1.19
	Non-persuasion	4.57	1.18
	Persuasion transparency	4.94	1.26
	Total	4.68	1.22

Table 188. Means and standard deviations of perceived assistive intent in transparency pretest 2

Effect	F	p	η_p^2
Suggestive content	0.39[a]	0.68	0.01
Transparency information	1.52[a]	0.22	0.02
Suggestive content x transparency information	2.15[b]	0.08	0.05
Persuasion (general) knowledge	0.09[c]	0.77	0.00
Topic (product) knowledge	5.14[c]	0.03	0.03

Note: [a] $F(2, 154)$, [b] $F(4, 154)$, [c] $F(1, 154)$, persuasion and topic knowledge as covariates

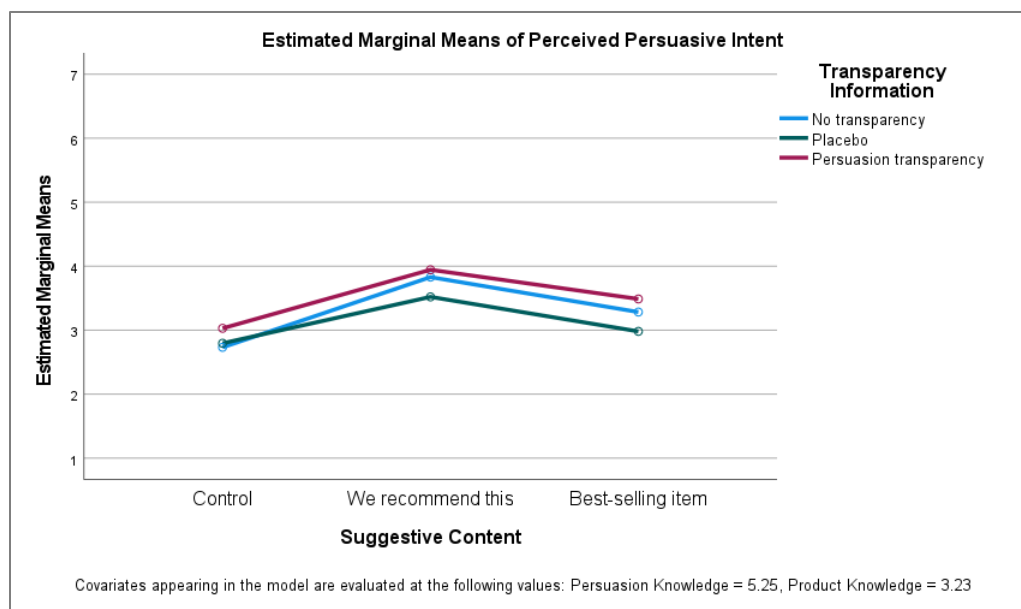**Table 189. Two-way ANOVA in perceived assistive intent in transparency pretest 2**
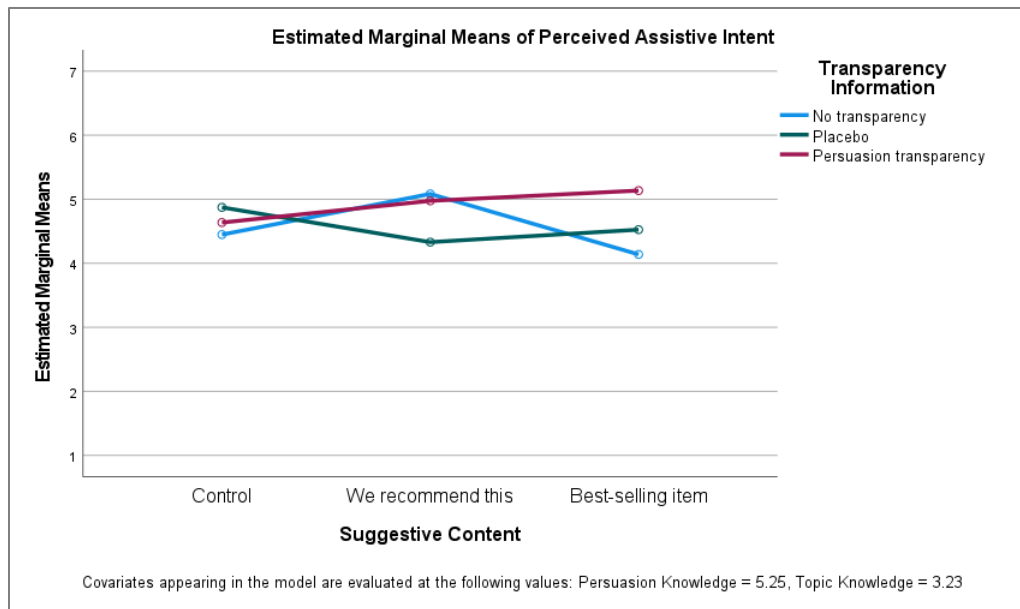
Figure 106. The difference in perceived assistive intent between the suggestive content and the transparency information condition in transparency pretest 2

Results on perceived user benefits. The Cronbach's alpha for the Perceived User Benefits scale was 0.77, supporting sufficient internal consistency reliability. I conducted a two-way ANOVA with general persuasion and topic knowledge as covariates. The means and standard deviations and well as the statistics are in Table 190 and Table 191. Results illustrated that transparency information had a significant impact on perceived user benefits with a small effect size. Also, a suggestive content x transparency information interaction was marginally significant with a small effect size. Follow-up tests using a Bonferroni correction showed that persuasion transparency significantly increased perceived user benefits when compared with no transparency, $p = .04$. Also, persuasion transparency, in the presence of "Best-selling item," led to higher perceived user benefits than no transparency, $p < .001$. Non-persuasion information, in the absence of suggestive content, marginally significantly resulted in higher perceived user benefits than no transparency, $p = .08$. Overall, these results indicated that providing persuasion transparency enhanced users' perceptions of their own benefits. Moreover, persuasion transparency increased users' perception

of their own benefits in the "Best-selling item" content. However, inconsistent with my expectation, non-persuasion information increased users' perception of their own benefits as well. This might result from the fact that the university's information might lend users' perception of the credibility of an agent who was behind the website. In addition, contrary to my prediction, persuasion transparency did not make any difference for the "We recommend this" condition. The reason might be the fact that individuals have already known how product recommendations work. Thus, adding persuasion transparency for those in this specific condition did not increase their own benefits perception. Figure 107 features the difference in perceived user benefits across the conditions.

Suggestive Content Manipulation	Transparency Information	Mean	Standard Deviation
Control (no content)	No transparency	4.74	0.99
	Placebo	5.31	0.77
	Persuasion transparency	5.22	1.09
	Total	5.09	0.97
We recommend this	No transparency	5.18	0.88
	Non-persuasion	4.75	1.11
	Persuasion transparency	5.10	1.03
	Total	5.02	1.00
Best-selling item	No transparency	4.77	1.11
	Non-persuasion	5.30	0.89
	Persuasion transparency	5.75	1.07
	Total	5.25	1.08
Total	No transparency	4.89	1.00
	Non-persuasion	5.14	0.94
	Persuasion transparency	5.34	1.08

Suggestive Content Manipulation	Transparency Information	Mean	Standard Deviation
	Total	5.12	1.02

Table 190. Means and standard deviations of perceived user benefits in transparency pretest 2

Effect	F	p	η_p^2
Suggestive content	1.21[a]	.30	.02
Transparency information	3.14[a]	.05	.04
Suggestive content x transparency information	2.12[b]	.08	.05
Persuasion (general) knowledge	0.36[c]	.55	.00
Topic (product) knowledge	0.19[c]	.66	.00

Note: [a] $F(2, 154)$, [b] $F(4, 154)$, [c] $F(1, 154)$, persuasion and topic knowledge as covariates

Table 191. Two-way ANOVA in perceived user benefits in transparency pretest 2

Figure 107. The difference in perceived user benefits between the suggestive content and the transparency information condition in transparency pretest 2

Results on careful evaluation. I captured the number of products participants compared or viewed as surrogates for careful evaluation. Two-way ANOVAs were conducted to assess the effect of suggestive content, transparency information, and their interaction on the number of products participants compared and viewed. Results indicated that there were no significant effects

on these two measures. Inconsistent with my prediction, those provided with persuasion transparency were not significantly more likely to explore more product alternatives to make careful evaluation and decision-making.

Effect	F	p	η_p^2
Number of products compared			
Suggestive content	0.46[a]	.63	.01
Transparency information	0.07a	.93	.00
Suggestive content x transparency information	0.42[b]	.79	.01
Number of products viewed			
Suggestive content	0.23[a]	.80	.00
Transparency information	1.42a	.25	.02
Suggestive content x transparency information	0.71[b]	.59	.02

Note: [a] $F(2, 116)$, [b] $F(4, 116)$

Table 192. Two-way ANOVAs in the number of products compared and viewed in transparency pretest 2

In addition, the time participants spent on a website to make product evaluation and decision was used as another careful evaluate measure. The means and standard deviations and the statistics are concluded in Table 193 and Table 194. Results from a two-way ANOVA revealed that transparency information significantly influenced time spent on a website with a medium effect size. Follow-up tests using a Bonferroni correction showed that non-persuasion information made participants spend more time on a website than no transparency, $p < .001$, and persuasion transparency, $p = .01$. This was not expected, as I hypothesized that persuasion transparency will lead to more careful evaluation. The fact that non-persuasion featuring the university's positive information, such as visions and values could induce perceived credibility of the website I developed. Thus, participants might be interested in exploring the website more than the other two conditions. See Figure 108 for the difference in time spent across the conditions.

Suggestive Content Manipulation	Transparency Information	Mean	Standard Deviation
Control (no content)	No transparency	289.83	144.75
	Non-persuasion	482.89	315.92
	Persuasion transparency	305.59	142.00
	Total	360.45	231.48
We recommend this	No transparency	308.84	210.04
	Non-persuasion	452.94	598.01
	Persuasion transparency	304.05	129.64
	Total	349.02	352.81
Best-selling item	No transparency	256.70	140.33
	Non-persuasion	457.60	325.47
	Persuasion transparency	325.29	108.49
	Total	347.65	231.10
Total	No transparency	284.54	166.46
	Non-persuasion	464.65	413.97
	Persuasion transparency	311.22	125.53
	Total	352.22	276.12

Table 193. Means and standard deviations of time spent on a website in transparency pretest 2

Effect	F	p	η_p^2
Suggestive content	0.03[a]	.97	.00
Transparency information	6.96[a]	.00	.08
Suggestive content x transparency information	0.12[b]	.98	.00

Note: [a] $F(2, 156)$, [b] $F(4, 156)$

Table 194. Two-way ANOVA in time spent of a website in transparency pretest 2
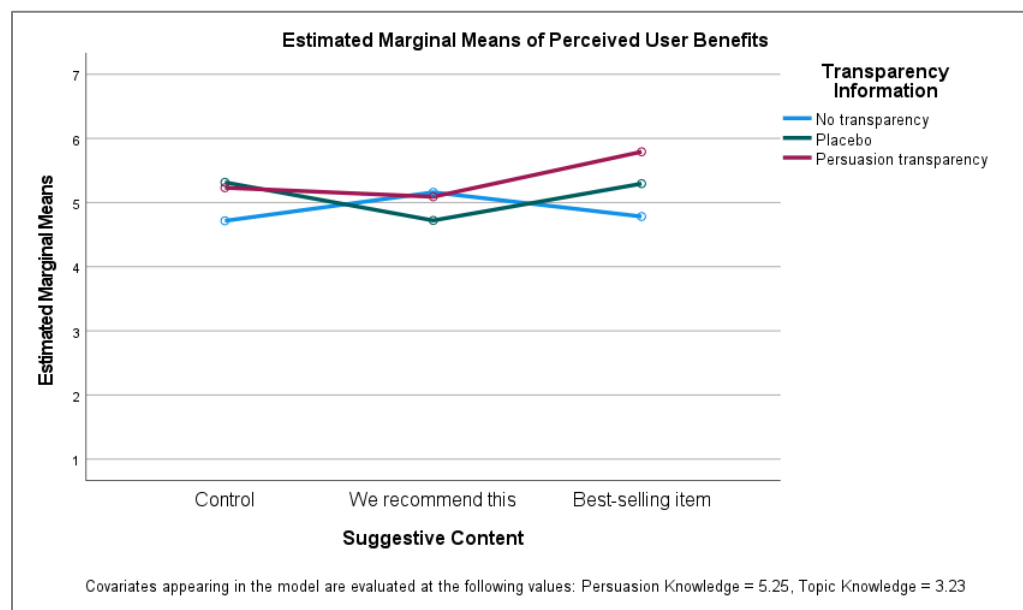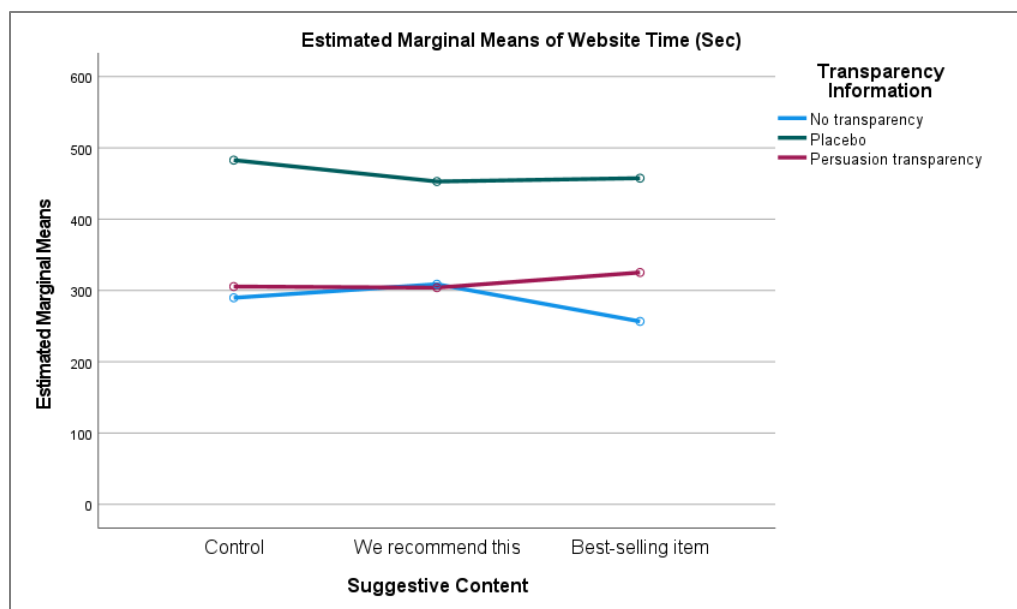
Figure 108. The difference in time spent on a website between the suggestive content and the transparency information condition in transparency pretest 2

Conclusion. This pretest lends support to the influence of transparency information on perceived user benefits and the impact of "Best-selling item" x persuasion transparency information on perceived assistive intent and perceived user benefits. However, inconsistent with my prediction, transparency information does not successfully increase perceived persuasive intent and agent benefits. Also, while there were no effects of transparency information on the number of product participants compared and viewed, such information affects their time spent on a website. Nevertheless, contrary to my expectation, it is the positive information about the agent, the university's visions and values, that makes users spend more time on a decision task, not persuasion transparency. This suggests that this university's information does not work as an effective non-persuasion. Therefore, in the next pretest, this non-persuasion design needs to change.

Appendix M Participants in Empirical Study 2

Criteria	Group	Experimental Condition												Total	$\chi2$	p
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**			
Finished	Not finished	1	1	0	0	0	0	0	0	0	0	0	0	2	9.84	.55
	Finished	43	41	43	43	42	40	41	41	44	44	39	44	505		
Wrong username	Correct username	42	40	43	43	42	40	41	41	44	43	38	44	500	N/A	N/A
	Wrong username	N/A a	N/A a	N/A a	N/A a	N/A a	N/A a	N/A a	N/A a	N/A a	N/A a	N/A a	N/A a			
Finished and correct username																
Order more than one item	One item	40	36	42	43	40	39	41	40	43	43	37	44	488	10.88	.45
	More than one item	2	3	1	0	2	1	0	1	1	0	1	0	12		
Website time >= 60 sec	Failed	0	0	0	0	1	0	0	0	0	0	0	0	1	10.93	.45
	Passed	42	39	43	43	41	40	41	41	44	43	38	44	499		

Criteria	Group	Experimental Condition												Total	χ^2	p
		1	2	3	4	5	6	7	8	9	10	11	12			
Mobile device	Desktop	41	39	42	42	40	40	39	41	44	43	37	44	492	10.25	.51
	Mobile	1	0	1	1	2	0	2	0	0	0	1	0	8		
Attention checks	Failed	1	3	5	5	2	4	2	3	1	4	1	2	33	9.15	.61
	Passed	41	36	38	38	40	36	39	38	43	39	37	42	467		
GA track	No track	8	11	9	13	10	10	13	10	10	14	8	12	129	4.74	.94
	Track	34	28	34	30	32	30	28	31	34	29	30	32	500		
Total	N	44	42	43	43	42	40	41	41	44	44	39	44	507		
Total finished and correct username	N	42	39	43	43	42	40	41	41	44	43	38	44	500		
Total usable sample	N	39	35	35	38	36	35	37	37	42	39	35	41	449	7.20	.78
Experiment 1 usable sample	N	18	21	16	18	17	16	17	19	17	17	13	20	209	8.51	.67

Criteria	Group	Experimental Condition												Total	χ^2	p
		1	2	3	4	5	6	7	8	9	10	11	12			
Experiment 2 usable sample	N	21	14	19	20	19	19	20	18	25	22	22	21	240	10.94	.45
Total usable sample with GA	N	32	24	29	26	27	27	24	27	33	26	28	30	333	7.28	.78
Experiment 1 usable sample with GA	N	17	15	13	10	13	12	12	14	9	10	10	17	152	14.75	.19
Experiment 2 usable sample with GA	N	15	9	16	16	14	15	12	13	24	16	18	13	181	12.89	.30

Note: Experimental condition 1 = content control + no information, 2 = content control + non-persuasion information, 3 = content control + persuasion transparency, 4 = "We recommend this" + no information, 5 = "We recommend this" + non-persuasion information, 6 = "We recommend this" + persuasion transparency, 7 = "Best-selling item" + no information, 8 = "Best-selling item" + non-persuasion information, 9 = "Best-selling item" + persuasion transparency, 10 = "Low in stock" + no information, 11 = "Low in stock" + non-persuasion information, 12 = "Low in stock" + persuasion transparency; [a] – participants who used the wrong username were removed from the analysis, as their pre- and post-questionnaire survey, as well as experimental condition, could not be tracked.

Table 195. Participants in empirical study 2 (experiment 1 and 2)

Appendix N Supplementary Analyses in Empirical Study 2

N.1 Perceived Informative Design

The Cronbach's alpha for the Perceived Informative Design scale was 0.74 after a reversed item (Info3_R) was removed, indicating sufficient internal consistency reliability. The means and standard deviations are reported in Table 196. Table 197 shows the ANOVA statistics. Results from a two-way ANOVA indicated that there were no significant effects of the suggestive content manipulation with a small effect size and persuasion transparency information with a small effect size, and no significant interaction between suggestive content and transparency information (a small effect size) on perceived informative design. Thus, participants did not perceive that the suggestive content was informative. Also, having been provided with persuasion transparency information did not increase their perception of the informativeness of a website. Figure 109 depicts the difference in perceived informative design between the suggestive content and transparency information manipulation.

Suggestive Content	Persuasion Transparency Information	Mean	Standard Deviation
Content Control	No information	5.99	0.87
	Non-persuasion information	6.06	0.85
	Persuasion transparency	5.70	1.38
	Total	5.92	1.06
We recommend this	No information	6.07	1.01
	Non-persuasion information	5.78	1.39
	Persuasion transparency	6.11	0.88
	Total	5.99	1.11

Suggestive Content	Persuasion Transparency Information	Mean	Standard Deviation
Best-selling item	No information	5.95	1.26
	Non-persuasion information	5.73	1.17
	Persuasion transparency	5.89	0.91
	Total	5.86	1.11
Low in stock	No information	6.17	1.06
	Non-persuasion information	5.74	1.20
	Persuasion transparency	5.65	1.38
	Total	5.85	1.24
Total	No information	6.04	1.05
	Non-persuasion information	5.83	1.16
	Persuasion transparency	5.83	1.17
	Total	5.90	1.13

Table 196. Means and standard deviations of perceived informative design in the suggestive content and the persuasion transparency information condition in empirical study 2

Effect	F	p	η_p^2
Suggestive content	0.34[a]	.79	.00
Persuasion transparency information	1.72[b]	.18	.01
Suggestive content x persuasion transparency information	0.96[c]	.45	.01

Note: [a] $F(3, 437)$, [b] $F(2, 437)$, [c] $F(6, 437)$

Table 197. Two-way ANOVA for perceived informative design in empirical study 2

Figure 109. The difference in perceived informative design between the suggestive content and the persuasion transparency information condition in empirical study 2

N.2   Additional Analyses on Perceived Personalization

I pooled data from empirical study 1 and study 2 to evaluate the effect of suggestive content on perceived personalization. Two ANOVAs were performed. Like the analysis in Chapter 5: 5.3.4, a 4 (suggestive content) x 3 (persuasion transparency information) ANOVA was conducted. Empirical study 1 was assigned to no information in terms of persuasion transparency information. The means and standard deviations and the statistics are reported in Table 198 and Table 199, respectively. Results indicated that suggestive content had a marginally significant effect with a small effect size. Follow-up tests using a Bonferroni correction revealed that "We recommend this" significantly led to higher perceived personalization than "Best-selling item," $p = .08$. No other significant differences were found. That is, "We recommend this" resulted in higher perceived personalization than "Best-selling item." Therefore, the suggestive content, specifically "We recommend this," affected perceived personalization. Figure 110 presents the difference in

perceived personalization between the four suggestive and the three persuasion transparency information conditions.

Suggestive Content	Persuasion Transparency Information	Mean	Standard Deviation
Content Control	No information	4.45	1.31
	Non-persuasion information	4.47	1.32
	Persuasion transparency	4.67	1.27
	Total	4.49	1.30
We recommend this	No information	4.59	1.36
	Non-persuasion information	4.60	1.08
	Persuasion transparency	5.04	1.00
	Total	4.68	1.25
Best-selling item	No information	4.52	1.26
	Non-persuasion information	4.26	1.35
	Persuasion transparency	4.33	1.23
	Total	4.43	1.27
Low in stock	No information	4.54	1.21
	Non-persuasion information	4.39	1.22
	Persuasion transparency	4.25	1.45
	Total	4.45	1.27
Total	No information	4.52	1.28
	Non-persuasion information	4.43	1.24
	Persuasion transparency	4.55	1.28

Suggestive Content	Persuasion Transparency Information	Mean	Standard Deviation
	Total	4.51	1.27

Table 198. Means and standard deviations of perceived personalization in the suggestive content and the persuasion transparency information condition in empirical study 1 and 2 (ANOVA 1)

Effect	F	p	η_p^2
Suggestive content	2.54[a]	.06	.01
Persuasion transparency information (3 levels)	0.48[b]	.62	.00
Suggestive content x persuasion transparency information (3 levels)	1.08[c]	.37	.01

Note: [a] $F(3, 727)$, [b] $F(2, 727)$, [c] $F(6, 727)$

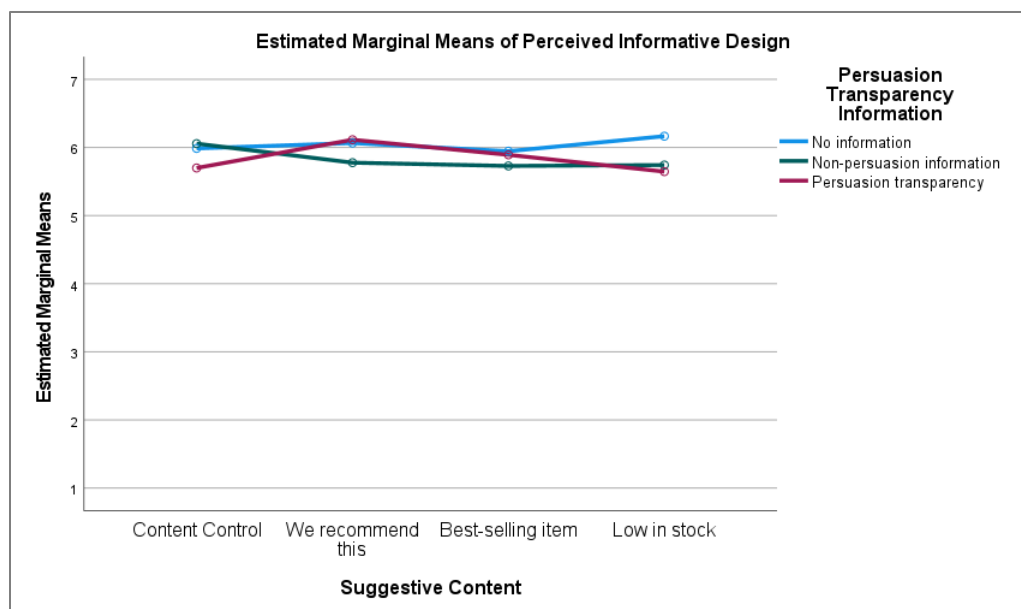**Table 199. Two-way ANOVA 1 in perceived suggestive design in empirical study 1 and 2**

Figure 110. The difference in perceived personalization between the suggestive content and the persuasion transparency information condition in empirical study 1 and 2 (ANOVA 1)

Additionally, a 4 (suggestive content) x 4 (persuasion transparency information) ANOVA was performed. One additional level of persuasion transparency information was assigned to those in empirical study 1. Empirical study 1 did not have the "about" page, while empirical study 2 had.

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The about page included no information, non-persuasion information, and persuasion transparency. The means and standard deviations and the statistics are presented in Table 200 and Table 201, respectively. Similar results were obtained. That is, suggestive content had a marginally significant effect with a small effect size. Follow-up tests using a Bonferroni correction showed no significant differences. This might be because the Bonferroni correction was too conservative. Without a correction, "We recommend this" significantly led to higher perceived personalization than "Best-selling item," $p = .02$ and "Low in stock," $p = .02$. Thus, the suggestive content influenced perceived personalization. Figure 111 presents the difference in perceived personalization between the four suggestive and the four persuasion transparency information conditions.

Suggestive Content	Persuasion Transparency Information	Mean	Standard Deviation
Content Control	No about page	4.41	1.38
	No information	4.50	1.20
	Non-persuasion information	4.47	1.32
	Persuasion transparency	4.67	1.27
	Total	4.49	1.30
We recommend this	No about page	4.44	1.44
	No information	4.87	1.18
	Non-persuasion information	4.60	1.08
	Persuasion transparency	5.04	1.00
	Total	4.68	1.25
Best-selling item	No about page	4.47	1.29
	No information	4.62	1.20

Suggestive Content	Persuasion Transparency Information	Mean	Standard Deviation
	Non-persuasion information	4.26	1.35
	Persuasion transparency	4.33	1.23
	Total	4.43	1.27
Low in stock	No about page	4.63	1.19
	No information	4.37	1.23
	Non-persuasion information	4.39	1.22
	Persuasion transparency	4.25	1.45
	Total	4.45	1.27
Total	No about page	4.49	1.32
	No information	4.59	1.20
	Non-persuasion information	4.43	1.24
	Persuasion transparency	4.55	1.28

Table 200. Means and standard deviations of perceived personalization in the suggestive content and the persuasion transparency information condition in empirical study 1 and 2 (ANOVA 2)

Effect	F	p	η_p^2
Suggestive content	2.38[a]	.07	.01
Persuasion transparency information (4 levels)	0.53[b]	.66	.00
Suggestive content x persuasion transparency information (4 levels)	1.14[c]	.33	.01

Note: [a] $F(3, 723)$, [b] $F(3, 723)$, [c] $F(9, 723)$

Table 201. Two-way ANOVA 2 in perceived suggestive design in empirical study 1 and 2
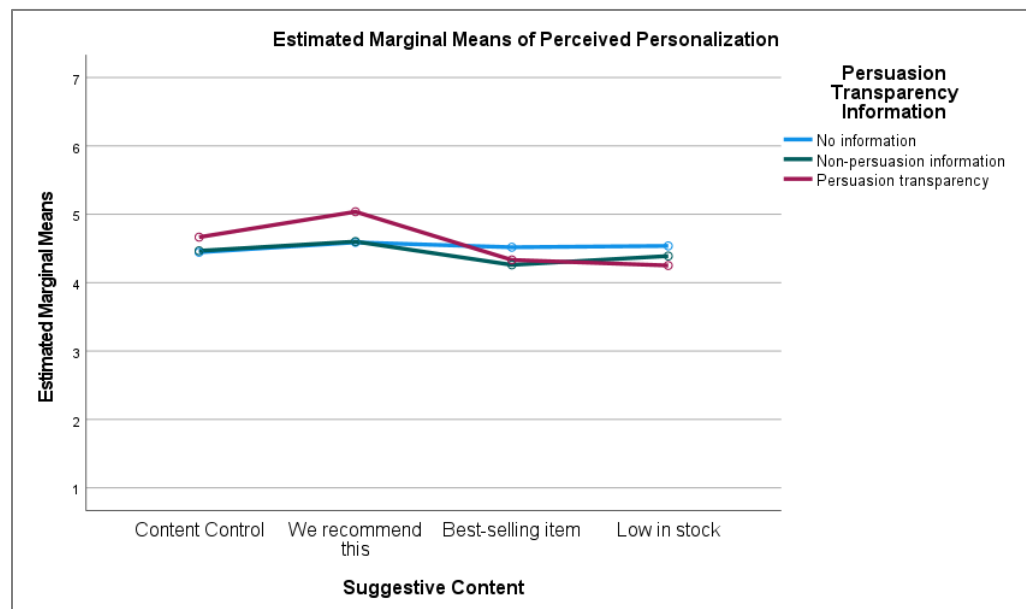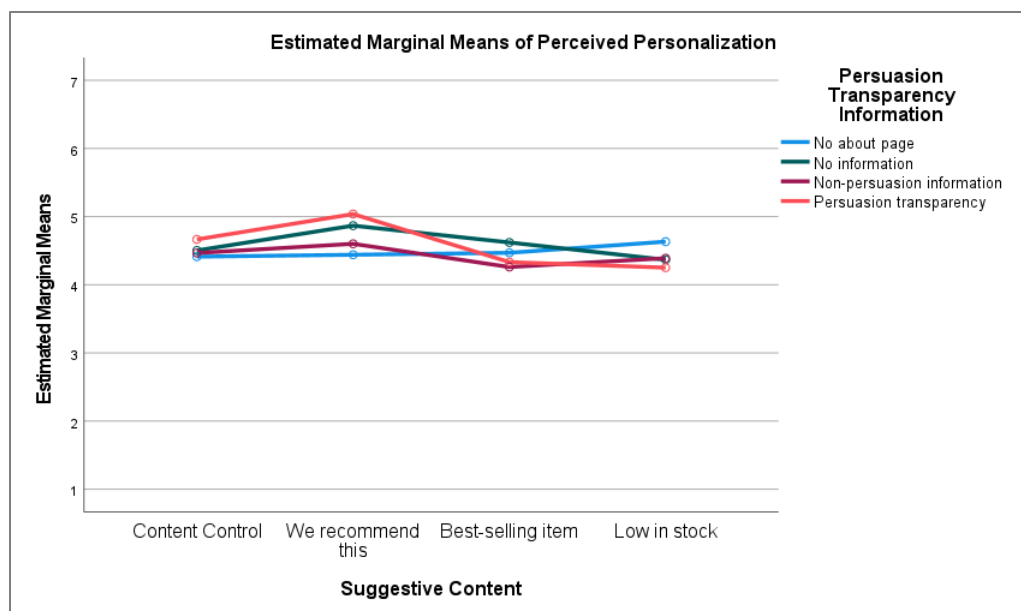
Figure 111. The difference in perceived personalization between the suggestive content and the persuasion transparency information condition in empirical study 1 and 2 (ANOVA 2)

N.3 Perceived Persuasion Tactic Knowledge

In this thesis, suggestive content manipulation serves as a persuasion tactic. Perceived persuasion tactic knowledge refers to how participants perceive the suggestive content they see. They can feel it as persuasive and/or assistive. This analysis compared the differences between those who were exposed to suggestive content only and excluded the content control condition. PTK1 and PTK3 reflect how the suggestive content grabs users' attention and makes them like the product, respectively, while PTK2 manifests how it helps them learn about the product. The first two items capture users' perceived persuasive intent and the last item measures their perceived assistive intent of the suggestive content. The analyses of these items reveal the effectiveness of persuasion transparency information. Specifically, I aim to investigate whether those without such information have already possessed this information. If there are no differences in perceived persuasive and assistive intent of the suggestive content between those with persuasion transparency information and those without such information, the persuasion transparency

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manipulation is not needed. In other words, if users have existing perceived persuasion knowledge regarding the suggestive content I manipulated, persuasion transparency information does not help them. In contrast, if those without persuasion transparency perceive that the manipulated suggestive content makes them feel that it is trying to help more than those with such information, persuasion transparency makes a difference. As a result, the analyses of the three items provide support to the effectiveness of persuasion transparency information.

First, I computed the mean of PTK1 and PTK3 to reflect perceived persuasive intent of the suggestive content. The Cronbach's alpha for this measure was 0.79. The means and standard deviations and the statistics appear in Table 202 and Table 203. Results from a two-way ANOVA showed that there was a marginally significant effect of the suggestive content with a small effect size. The effect of persuasion transparency information and a suggestive content x persuasion transparency interaction were not significant with a small effect size. Follow-up tests using a Bonferroni correction indicated that "Low in stock" was more persuasive than "We recommend this," $p = .06$. This means that only suggestive content influenced the perceived persuasive intent of specific content. Therefore, regardless of the presence of persuasion transparency, individuals already knew that the suggestive content had a persuasive intent. The difference in perceived persuasive intent of suggestive content is depicted in Figure 112.

Suggestive Content	Persuasion Transparency Information	Mean	Standard Deviation
We recommend this	No information	3.67	1.53
	Non-persuasion information	4.40	1.57
	Persuasion transparency	3.49	1.53

Suggestive Content	Persuasion Transparency Information	Mean	Standard Deviation
	Total	3.85	1.58
Best-selling item	No information	4.35	1.45
	Non-persuasion information	4.19	1.52
	Persuasion transparency	3.94	1.76
	Total	4.15	1.59
Low in stock	No information	4.24	1.31
	Non-persuasion information	4.33	1.45
	Persuasion transparency	4.41	1.54
	Total	4.33	1.43
Total	No information	4.09	1.45
	Non-persuasion information	4.31	1.50
	Persuasion transparency	3.97	1.65
	Total	4.12	1.54

Table 202. Means and standard deviations of perceived persuasion tactic knowledge (persuasive) in the suggestive content and the persuasion transparency information condition in empirical study 2

Effect	F	p	η_p^2
Suggestive content	2.79[a]	.06	.02
Persuasion transparency information	1.58[b]	.21	.01
Suggestive content x persuasion transparency information	1.49[c]	.21	.02

Note: [a] $F(3, 437)$, [b] $F(2, 437)$, [c] $F(6, 437)$

Table 203. Two-way ANOVA in perceived persuasion tactic knowledge (persuasive) in empirical study 2

Figure 112. The difference in perceived persuasion tactic knowledge (assistive) between the suggestive content and the persuasion transparency information condition in empirical study 2

In addition, I analyzed the positive side of a persuasion tactic, perceived assistive intent of specific content, by using PTK2. Table 204 and Table 205 present the means and standard deviations and the statistics, respectively. Results from a two-way ANOVA revealed that there were a marginally significant impact of persuasion transparency information with a small effect size and a significant suggestive content x persuasion transparency information interaction with a small effect size. The suggestive content had no significant effect with a small effect size. Follow-up tests using a Bonferroni correction were performed. For persuasion transparency information, no significant differences were found. The presence of persuasion transparency information had a higher level of perceived assistive intent of suggestive content than no information, $p = .10$. However, in the presence of "We recommend this," persuasion transparency information was perceived to be less assistive than non-persuasion information, $p = .01$. Also, in the presence of "Best-selling item," persuasion transparency was perceived as less assistive than no information, $p = .02$. These demonstrated that without persuasion transparency information, individuals perceived "We

recommend this" and "Best-selling item" more assistive than non-persuasion information and no

information, respectively. See Figure 113 for the difference in this measure.

Suggestive Content	Persuasion Transparency Information	Mean	Standard Deviation
We recommend this	No information	3.47	1.67
	Non-persuasion information	4.31	1.60
	Persuasion transparency	3.09	1.79
	Total	3.62	1.75
Best-selling item	No information	4.22	1.69
	Non-persuasion information	3.35	1.72
	Persuasion transparency	3.17	1.71
	Total	3.56	1.75
Low in stock	No information	3.28	1.54
	Non-persuasion information	3.23	1.68
	Persuasion transparency	3.29	1.72
	Total	3.27	1.64
Total	No information	3.65	1.67
	Non-persuasion information	3.63	1.72
	Persuasion transparency	3.19	1.72
	Total	3.48	1.71

Table 204. Means and standard deviations of perceived persuasion tactic knowledge (assistive) in the suggestive content and the persuasion transparency information condition in empirical study 2

Effect	F	p	η_p^2
Suggestive content	1.49[a]	.23	.01

Effect	F	p	η_p^2
Persuasion transparency information	2.90^b	.06	.02
Suggestive content x persuasion transparency information	3.22^c	.01	.04

Note: [a] $F(3, 437)$, [b] $F(2, 437)$, [c] $F(6, 437)$

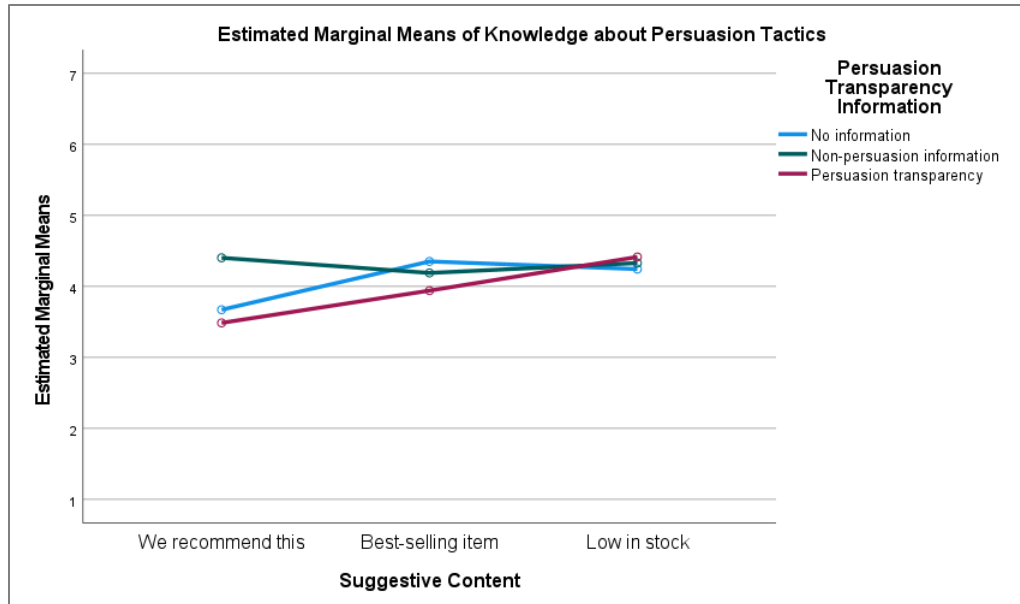**Table 205. Two-way ANOVA in perceived persuasion tactic knowledge (assistive) in empirical study 2**
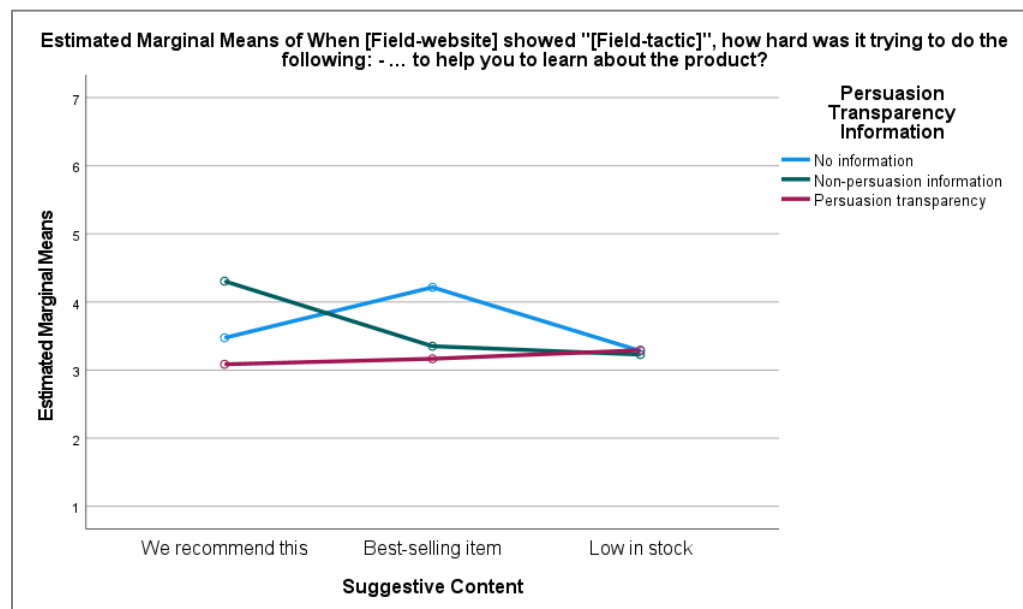
Figure 113. The difference in perceived persuasion tactic knowledge (assistive) between the suggestive content and the persuasion transparency information condition in empirical study 2

N.4   Results on Perceived Agent Intent (Open-Ended)

In addition to the persuasion tactic knowledge measure, an open-ended question was used to capture the participant's perceived intent of suggestive content. These participants received suggestive content when interacting with the website. Since perceived persuasion and assistance focus on an overall evaluation of an online entity, no perceived agent intent of suggestive content was measured in empirical study 1. Also, this measure reveals whether participants have already known about the intent of suggestive content. Thus, persuasion transparency information effectiveness can be implied from this measure. For instance, if those with persuasion transparency

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information perceive persuasive intent of suggestive content more than those without such information, persuasion transparency information works. Or if those without persuasion transparency information perceived assistive intent of suggestive content more than those without such information, persuasion transparency manipulation works. I borrowed the following open-ended question from Campbell and Kirmani (2000): *"Why do you think [agent name] told you about [persuasion tactic]?"* Participants who were assigned to "We recommend this," "Best-selling item," and "Low in stock" were asked this question.

I coded their responses as follows: 1) persuasive intent – assigned 1 when they reasoned that the website was trying to make sales, or 0 if they did not give associated reasons, promote a product, and/or grab their attention, and 2) assistive intent – assigned 1 when they reasoned that the website was trying to help or inform them, or 0 if they did not provide related reasons. In this manner, participants could perceive both intents. Those who did not provide answers regarding the website's intent were removed, resulting in 314 usable participants. To assess their perceived intent of suggestive content, I conducted Chi-square tests with suggestive content and persuasion transparency information.

For perceived persuasive intent of suggestive content, the statistics are reported in Table 206. The overall results revealed that there was a significant relationship between suggestive content and perceived persuasive intent of suggestive content. Also, there was a marginally significant difference in perceived persuasive intent of suggestive content between the suggestive content conditions for non-persuasion information. However, no significant differences in perceived persuasive intent between the suggestive content conditions for no information and for persuasion transparency were found. Follow-up Z tests using a Bonferroni correction were performed. Results

suggested there those with "We recommend this" significantly had less persuasive intent and more no persuasive intent than those with "Low in stock," $p < .05$, while those with "Best-selling item" did not differ from the other two conditions, $p > .05$. Nevertheless, no significant difference between suggestive content conditions for those who received non-persuasion information, $p > .05$. Therefore, "We recommend this" was perceived to have a less degree of persuasive intent than "Low in stock." In contrast, persuasion transparency did not influence this perception. See Figure 114 for the difference in perceived persuasive intent of suggestive content between the three suggestive content conditions.

Effect	N	$\chi^2(2)$	p
No information	109	4.32	.12
Non-persuasion information	95	5.78	.06
Persuasion transparency	110	4.59	.10
Total	314	14.15	.00

Table 206. Chi-square tests in perceived persuasive intent of suggestive content (open-ended) in empirical study 2
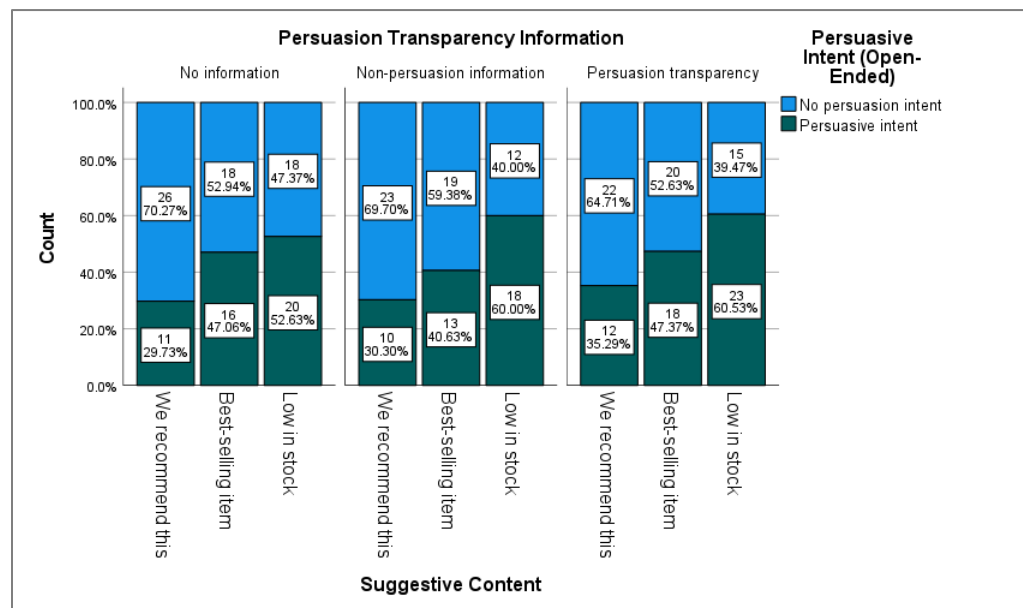
Figure 114. The difference in perceived persuasive intent of suggestive content (open-ended) in empirical study 2

For perceived assistive intent of suggestive content, the statistics are reported in Table 207. The overall results revealed a significant relationship between suggestive content and perceived assistive intent. There was also a marginally significant difference in perceived assistive intent of suggestive content between the suggestive content conditions for non-persuasion information. Nonetheless, no significant differences in perceived assistive intent between the suggestive content conditions for no information and for persuasion transparency were found. Follow-up Z tests using a Bonferroni correction were conducted. Results showed those with "We recommend this" significantly had more assistive intent and less no assistive intent than those with "Low in stock," $p < .05$, while those with "Best-selling item" did not differ from the other two conditions, $p > .05$. However, no significant difference between suggestive content conditions for those who received non-persuasion information, $p > .05$. As a result, individuals perceived that "We recommend this" had more assistive intent than "Low in stock." On the contrary, persuasion transparency did not impact the perceived assistive intent of suggestive content. See Figure 115 for the difference in perceived assistive intent of suggestive content between the three suggestive content conditions.

Effect	N	$\chi^2(2)$	p
No information	109	0.16	.93
Non-persuasion information	95	6.53	.04
Persuasion transparency	110	3.76	.15
Total	314	7.72	.03

Table 207. Chi-square tests in perceived assistive intent of suggestive content (open-ended) in empirical study 2
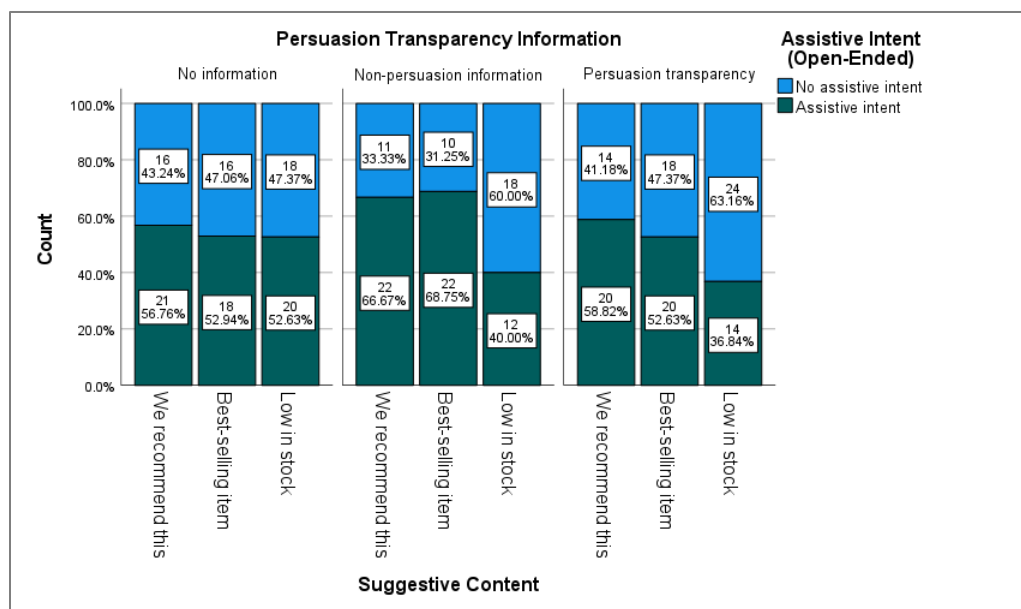
Figure 115. The difference in perceived assistive intent of suggestive content (open-ended) in empirical study 2

Additionally, I computed the scores to reflect the difference between perceived persuasive intent and perceived assistive intent of suggestive content. Thus, the score of 1 means that participants perceived suggestive content as more persuasive. The score of 0 means that they felt that the suggestive content was equally persuasive and assistive. The score of -1 means that participants thought that the suggestive content was more assistive. The statistics appear in Table 208. The overall results demonstrated that a significant relationship between suggestive content and the scores was found. Also, there were also a marginally significant differences in this score between the suggestive content conditions for non-persuasion information and for persuasion transparency. Follow-up Z tests using a Bonferroni correction were performed. Results pointed out that those with "We recommend this" significantly perceived it as less persuasive and more assistive than those with "Low in stock," $p < .05$, whereas those with "Best-selling item" did not significantly differ from the other two conditions, $p > .05$. In the presence of non-persuasion information, "We recommend this" had significantly more assistive intent than "Low in stock," $p < .05$. In the presence of persuasion transparency, those with "We recommend this" was significantly more

persuasive than those with "Low in stock," $p < .05$. No other significant differences were found, $p > .05$. Consequently, participants perceived that "We recommend this" had more assistive intent and less persuasive intent than "Low in stock." Also, there were differences in the scores for non-persuasion information and for persuasion transparency. This suggests that persuasion transparency affected participants' interpretation of suggestive content. Specifically, those with non-persuasion information perceived "We recommend this" as more assistive than "Low in stock," while those with persuasion transparency perceived "We recommend this" as more persuasive than "Low in stock." See Figure 116 for the difference in perceived persuasive – assistive intent of suggestive content between the three suggestive content conditions.

Effect	N	$\chi^2(2)$	p
No information	109	2.61	.63
Non-persuasion information	95	9.24	.06
Persuasion transparency	110	8.63	.07
Total	314	13.76	.01

Table 208. Chi-square tests in perceived persuasive – assistive intent of suggestive content (open-ended) in empirical study 2
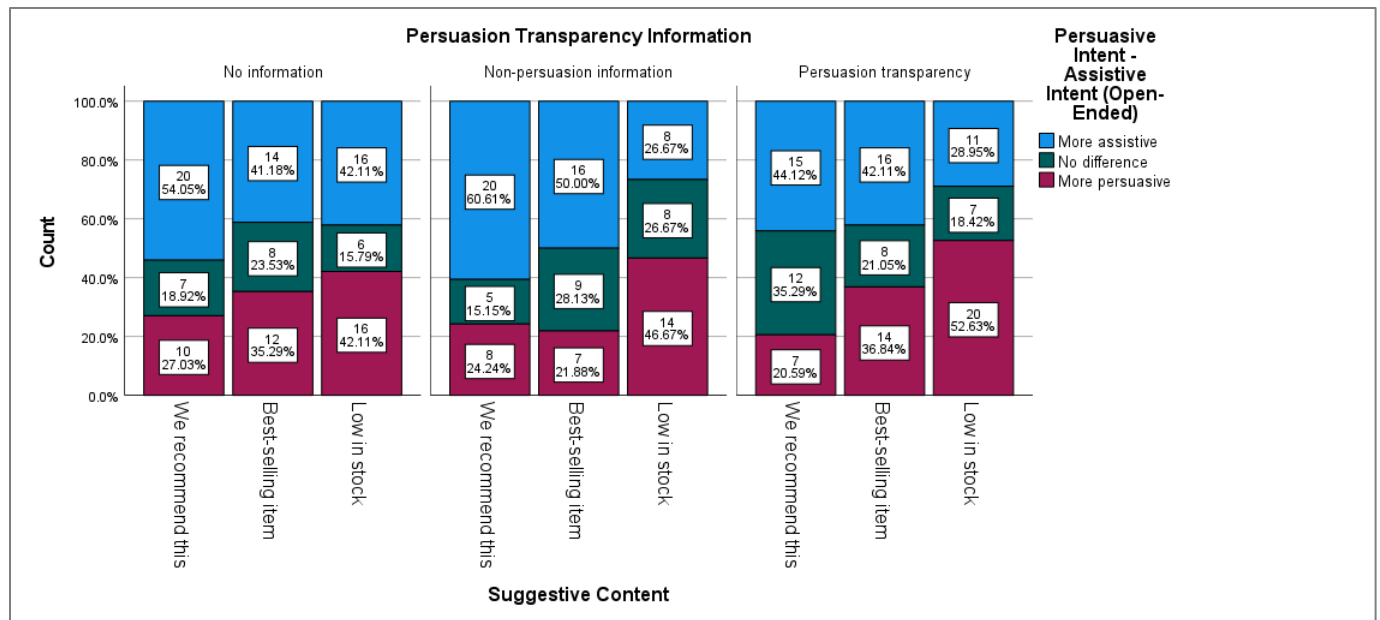
Figure 116. The difference in perceived persuasive – assistive intent of suggestive content (open-ended) in empirical study 2

N.5 Results on Perceived Agent Costs

Effect of suggestive content and persuasion transparency. In this analysis, I employed the latent variable score. The Cronbach's alpha for the Perceived Agent Costs was 0.85, indicating sufficient internal consistency reliability. A two-way ANOVA was performed. The means and standard deviations are reported in Table 209. The statistics appear in Table 210. Results demonstrated no significant effect of suggestive content with a small effect size, no significant effect of persuasion transparency with a trivial effect size, and no interaction between the two factors with a small effect size Thus, suggestive content, persuasion transparency information, and their interaction did not affect perceived agent costs. See Figure 117 for the difference in perceived agent costs between the suggestive content and the persuasion transparency information condition.

Suggestive Content	Persuasion Transparency Information	Mean	Standard Deviation
Content Control	No information	0.00	1.03

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Suggestive Content	Persuasion Transparency Information	Mean	Standard Deviation
	Non-persuasion information	-0.02	1.03
	Persuasion transparency	0.10	0.99
	Total	0.03	1.01
We recommend this	No information	0.16	0.81
	Non-persuasion information	-0.04	1.11
	Persuasion transparency	0.18	0.86
	Total	0.10	0.93
Best-selling item	No information	-0.01	1.12
	Non-persuasion information	-0.07	1.04
	Persuasion transparency	-0.22	0.99
	Total	-0.10	1.04
Low in stock	No information	0.08	0.91
	Non-persuasion information	-0.05	1.09
	Persuasion transparency	-0.08	1.07
	Total	-0.02	1.02
Total	No information	0.06	0.97
	Non-persuasion information	-0.04	1.06
	Persuasion transparency	-0.02	0.99
	Total	0.00	1.00

Table 209. Means and standard deviations of perceived agent costs in the suggestive content and the persuasion transparency information condition in empirical study 2

Effect	F	p	η_p^2
Suggestive content	0.75	.52	.01

Effect	F	p	$\eta_p{}^2$
Persuasion transparency information	0.39	.68	.00
Suggestive content x persuasion transparency information	0.35	.91	.01

Note: [a] $F(3, 437)$, [b] $F(2, 437)$, [c] $F(6, 437)$

Table 210. Two-way ANOVA in perceived agent costs in empirical study 2
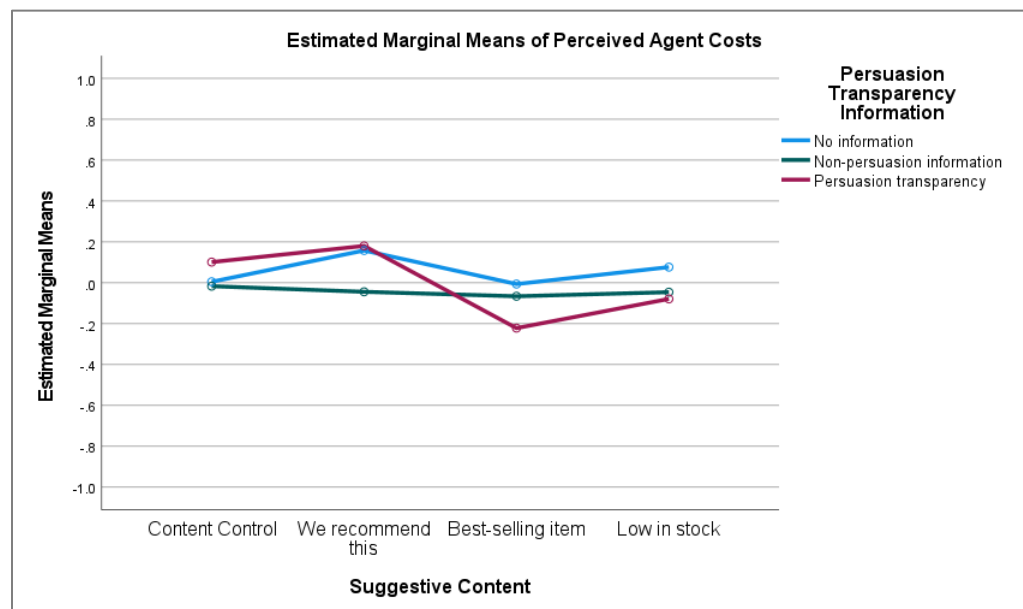
Figure 117. The difference in perceived agent costs between the suggestive content and the persuasion transparency information condition in empirical study 2

Effect of perceived personalization. As I hypothesized the effect of perceived personalization on perceived agent costs, I included perceived personalization as a covariate in a two-way ANOVA. Results manifested that only perceived personalization had a significant effect on perceived agent costs, $F(1, 436) = 182.36$, p < .001, $\eta_p{}^2 = .30$ with a large effect size. No other significant effects were found. Consequently, perceived personalization influenced perceived agent costs.

Discussion on perceived agent costs. The above analyses offer support for the relationship between perceived personalization and perceived agent costs, hence supporting H17. In other words, perceived personalization leads to perceived agent costs.

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N.6   Results on Careful Evaluation of Products

To reflect users' careful evaluation, I measured time spent on a decision task (total website time – time spent on the about page), the number of products compared, and the number of products viewed. These objective measures are available for those who used non-private browser mode to access the website (GA track). Two-way ANOVAs were performed. Table 211 details the statistics. Results suggested that there were no significant effect of suggestive content, no significant impact of persuasion transparency information, and no significant interaction between suggestive content and persuasion transparency information. Thus, inconsistent with my expectation, persuasion transparency information did not influence decision task time, the number of products compared, and the number of products viewed. In other words, persuasion transparency information did not increase users' careful evaluation.

Measure	Suggestive Content			Transparency Information			Suggestive Content x Transparency Information		
	$F(3, 333)$	p	$\eta_p{}^2$	$F(2, 333)$	p	$\eta_p{}^2$	$F(6, 333)$	p	$\eta_p{}^2$
Decision task time	1.04	.37	.01	0.01	.99	.00	0.63	.71	.01
Number of products compared	1.49	.22	.01	0.85	.43	.01	0.28	.95	.01
Number of products viewed	0.98	.40	.01	0.43	.65	.00	0.63	.70	.01

Table 211. Two-way ANOVAs in measures for careful evaluation in empirical study 2

N.7   Impacts of Persuasion Awareness and Relevant Constructs

PLS was used to examine the structural model proposed on the right-hand side of Figure 118.

Construct reliability and validity. First, the measurement model was evaluated in terms of internal consistency and discriminant validity (Barclay et al. 1995). The measurement items generally load heavily on their respective constructs, with loadings greater than 0.70. Loadings and cross-loadings of all items are reported in Table 212. The internal consistency reliability was supported by the composite reliability and Cronbach's alpha greater than 0.70 (see Table 213). According to Barclay et al. (1995), the square root of average variance extracted (AVE) of each latent variable should be greater than the correlation between itself and others. This was evident (see Table 213). There was also no loading above the loadings of the respective latent variables (see Table 212). Therefore, discriminant validity was satisfactory.
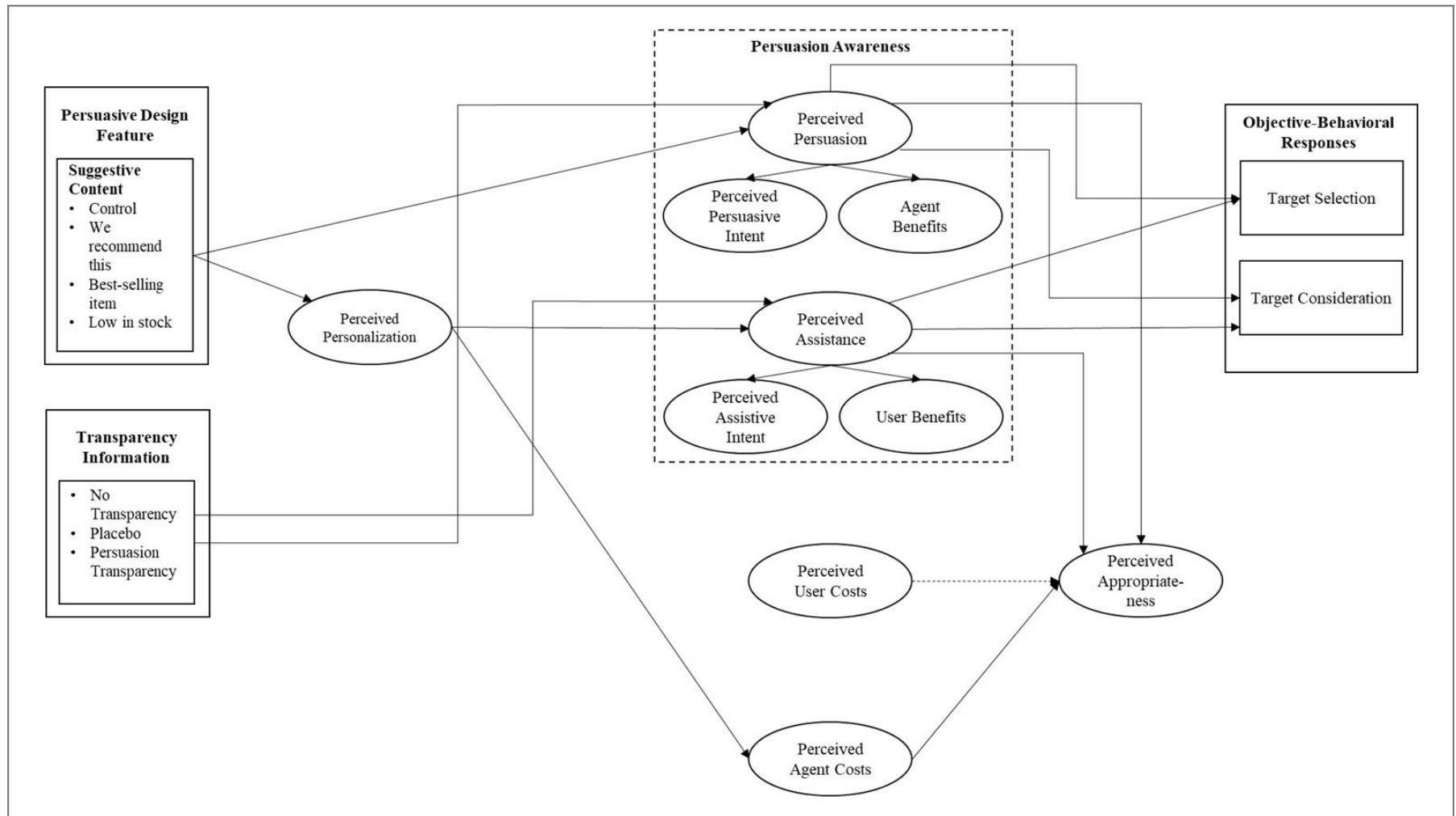
Figure 118. Extended research model tested in empirical study 2

Item	AB	AC	AS	AP	AS-UB	PE	PE-AB	TS	UB	UC
Appropriate1	-0.07	0.69	0.49	**0.90**	0.58	-0.13	-0.12	0.03	0.58	0.04
Appropriate2	-0.08	0.68	0.45	**0.89**	0.55	-0.09	-0.10	0.03	0.55	0.04
Appropriate3	-0.19	0.49	0.37	**0.74**	0.43	-0.25	-0.26	0.01	0.42	0.07
Assist1	0.06	0.54	**0.90**	0.46	**0.84**	0.07	0.07	0.04	0.63	-0.01
Assist2	0.08	0.52	**0.87**	0.41	**0.79**	0.13	0.13	0.10	0.57	-0.06
Assist3	0.00	0.49	**0.84**	0.49	**0.79**	0.02	0.01	0.01	0.58	0.05
Persuasive1	0.51	-0.11	0.01	-0.23	-0.06	**0.86**	**0.83**	0.11	-0.12	0.06
Persuasive2	0.53	-0.01	0.11	-0.09	0.06	**0.87**	**0.84**	0.18	0.00	0.08
Persuasive3	0.52	-0.04	0.09	-0.14	0.01	**0.86**	**0.83**	0.13	-0.08	0.05
UBenefit1	-0.02	0.58	0.61	0.53	**0.81**	-0.04	-0.03	0.00	**0.89**	0.08
UBenefit2	-0.06	0.55	0.59	0.52	**0.79**	-0.05	-0.05	-0.03	**0.87**	0.11
UBenefit3	-0.06	0.38	0.48	0.48	**0.64**	-0.13	-0.12	-0.06	**0.71**	0.12
UCost_E1	0.04	0.03	0.00	0.07	0.06	0.05	0.05	-0.02	0.11	**0.94**
UCost_E2	0.04	0.03	-0.02	0.03	0.04	0.06	0.06	-0.02	0.10	**0.85**
UCost_E3	0.07	0.02	-0.01	0.03	0.06	0.10	0.10	-0.02	0.12	**0.79**
WBenefit_S2	**1.00**	-0.07	0.06	-0.13	0.01	0.61	**0.79**	0.09	-0.05	0.05
WCost1	0.01	**0.85**	0.48	0.54	0.54	0.02	0.02	0.03	0.50	0.01
WCost2	-0.03	**0.91**	0.53	0.65	0.59	-0.01	-0.02	0.02	0.55	0.05
WCost3	-0.14	**0.87**	0.54	0.74	0.60	-0.15	-0.16	0.04	0.56	0.02
Target selection	0.09	0.03	0.06	0.03	0.01	0.16	0.16	**1.00**	-0.04	-0.02

Note: AP = perceived appropriateness, AS = perceived assistive intent, AS-UB = perceived assistance (perceived assistive intent - perceived user benefits), PE = perceived persuasive intent, PE-AB = perceived persuasion (perceived persuasive intent – perceived agent benefits), UB = perceived user benefits, UC = perceived user costs, AB = perceived agent benefits, AC = perceived agent costs, TS = target selection, factor loadings to their respective construct are in bold

Table 212. Loadings and cross-loadings of measures in empirical study 2

	α	CR	AVE	AB	AC	AS	AP	AS-UB	PE	PE-AB	TS	UB	UC
AB	1.00	1.00	1.00	1.00									
AC	0.85	0.91	0.77	-0.07	0.88								
AS	0.84	0.90	0.76	0.06	0.59	0.87							
AP	0.79	0.88	0.71	-0.13	0.74	0.52	0.84						
AS-UB	0.87	0.90	0.61	0.01	0.66	0.92	0.62	0.78					
PE	0.83	0.90	0.75	0.61	-0.06	0.08	-0.18	0.00	0.86				
PE-AB	0.84	0.89	0.68	0.79	-0.07	0.08	-0.18	0.00	0.97	0.82			
TS	1.00	1.00	1.00	0.09	0.03	0.06	0.03	0.01	0.16	0.16	1.00		
UB	0.76	0.86	0.68	-0.05	0.62	0.68	0.62	0.91	-0.08	-0.08	-0.04	0.83	
UC	0.85	0.90	0.75	0.05	0.03	-0.01	0.05	0.06	0.07	0.07	-0.02	0.12	0.86

Note: α = Cronbach's alpha, CR = composite reliability, AVE = average variance extracted, AP = perceived appropriateness, AS = perceived assistive intent, AS-UB = perceived assistance (perceived assistive intent - perceived user benefits), PE = perceived persuasive intent, PE-AB = perceived persuasion (perceived persuasive intent – perceived agent benefits), UB = perceived user benefits, UC = perceived user costs, AB = perceived agent benefits, AC = perceived agent costs, TS = target selection, off-diagonal = correlations, diagonal = the square root of AVE

Table 213. Internal consistency and discriminant validity in empirical study 2

Common method bias. To identify the common method bias (CMB), I employ Kock et al. (2012)'s full collinearity test (Kock 2017). First, a random dummy variable with values varying from 0 to 1 was created. Next, a model where all constructs appeared in Figure 19 pointing at this dummy variable and performed the PLS analysis was specified. As Kock (2017) suggests, "the occurrence of a VIF greater than 3.3 is proposed as an indication of pathological collinearity and also as an indication that a model may be contaminated by common method bias" (p. 253). Following this, all VIFs resulting from the PLS analysis in Table 214 were inspected. Results indicated that CMB would not concern this model, as all VIFs were lower than 3.3.

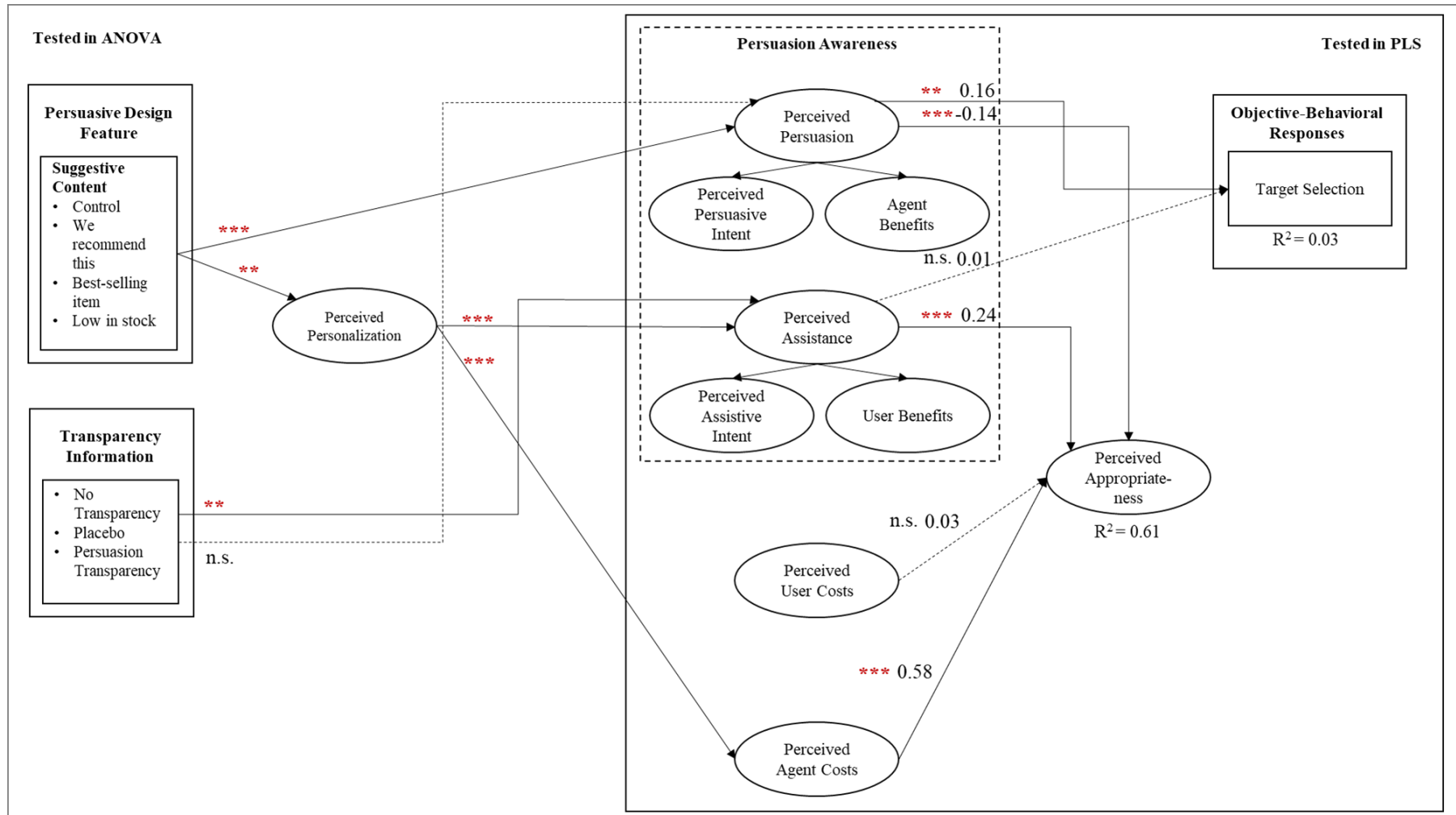| Construct	*VIF*
Perceived appropriateness	1.97
Perceived assistance	2.34
Perceived personalization	1.97
Perceived persuasion	1.07
Perceived user costs	1.02
Perceived agent costs	2.13

Table 214. VIFs of the constructs in the structural model in empirical study 2

Structural model. Bootstrap resampling was performed on the structural model to assess path significance. Results depicted in Figure 119 and Table 215 indicated that perceived persuasion (higher-order construct: perceived persuasive intent – perceived agent benefits) had a significant and negative impact on perceived appropriateness, thus supporting H1. Results also revealed that perceived assistance (higher-order construct: perceived assistive intent – perceived agent benefits) had a significant and positive impact on perceived appropriateness, therefore supporting H2. However, perceived user costs did not show a significant relationship with perceived appropriateness, thereby failing to support H3. Perceived agent costs had a significant and positive

effect on perceived appropriateness, hence supporting H4. The model accounted for 61% of the variances in perceived appropriateness. Additionally, perceived persuasion had a significant and positive relationship with targeted product selection, while perceived assistance did not. Consistent with PKM's prediction, those who were aware of a persuasion attempt were more likely to carefully evaluate such attempt and make a decision based on whether that fit their interests. That is, participants who perceived persuasion of an online entity were more likely to choose the targeted product. Nevertheless, perceived assistance did not have a significant effect on targeted product selection. This is inconsistent with my expectation that perceived assistance will attribute to targeted product selection. The model accounted for 3% of the variance in targeted product selection.

Effect	R^2	t	p
Perceived appropriateness	0.61		
Perceived persuasion → perceived appropriateness		4.67	.00
Perceived assistance → perceived appropriateness		4.51	.00
Perceived user costs → perceived appropriateness		0.83	.40
Perceived agent costs → perceived appropriateness		12.59	.00
Target selection	0.03		
Perceived persuasion → target selection		3.04	.00
Perceived assistance → target selection		0.32	.75

Table 215. Structural path analysis using PLS in empirical study 2
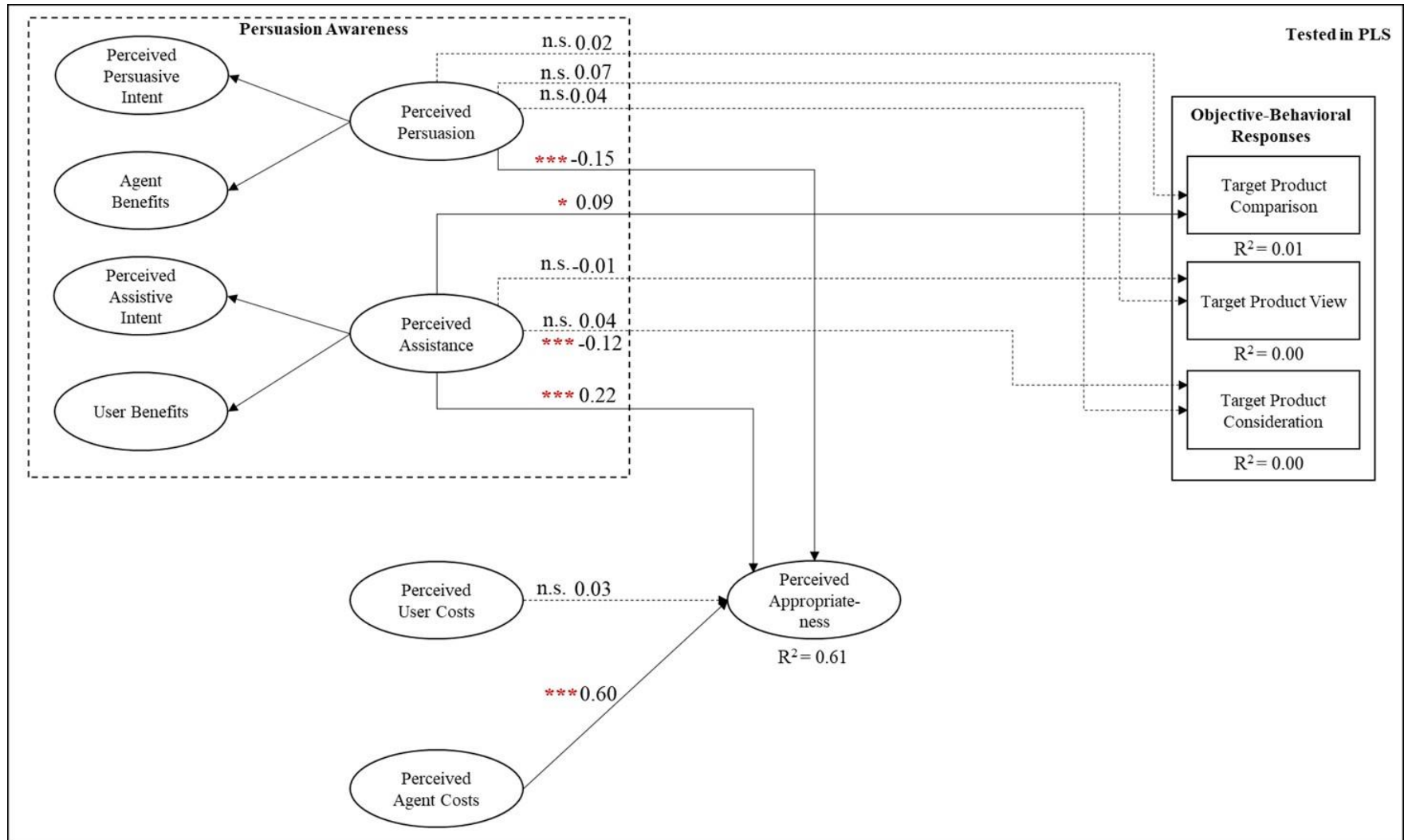
Note: * $p < .10$, ** $p < .05$, *** $p < .001$, n.s. $p > .1$ level, rectangles = observable constructs, ellipses = non-observable constructs

Figure 119. Structural path model in empirical study 2

In addition, bootstrap resampling was conducted on the structural model for participants with GA information only. Product consideration is an objective measure retrieved from GA. It captures whether users add a target to compare or view it in more detail. These objective measures reflect users' careful targeted product evaluation and were included in the structural model. Results (GA track only) shown in Table 216 and Figure 120 suggested similar results to those in Table 215 and Figure 119. Additionally, perceived persuasion did not have significant relationships with targeted product comparison, targeted product view, and targeted product consideration. Perceived assistance had a marginally significant and positive correlation with targeted product comparison. However, only 1% of the variance in targeted comparison was explained.

Effect	R^2	t	p
Perceived appropriateness	0.61		
Perceived persuasion → perceived appropriateness		3.65	.00
Perceived assistance → perceived appropriateness		3.68	.00
Perceived user costs → perceived appropriateness		0.82	.42
Perceived agent costs → perceived appropriateness		11.68	.00
Target comparison	0.01		
Perceived persuasion → target comparison		0.29	.77
Perceived assistance → target comparison		1.71	.09
Target view	0.00		
Perceived persuasion → target view		1.10	.27
Perceived assistance → target view		0.18	.86
Target consideration	0.00		
Perceived persuasion → target consideration		0.77	.44
Perceived assistance → target consideration		0.76	.45

Table 216. Structural path analysis using PLS in empirical study 2 with GA track only

Note: * *p* < .10, ** *p* < .05, *** *p* < .001, n.s. *p* > .1 level, rectangles = observable constructs, ellipses = non-observable constructs

Figure 120. Structural path model in empirical study 2 with GA track only

Supplementary evidence for the impact of persuasion awareness on product consideration.

Inconsistent with empirical study 1, this study revealed that perceived persuasion was not significantly correlated with targeted product consideration, comparison, or view. Accordingly, I conducted a supplemental analysis. I applied binary logistic regression to evaluate the effect of perceived persuasion and perceived assistance on these behaviors. The statistics are included in Table 217. Results demonstrated that perceived persuasion did not significantly predict the probability of a targeted product consideration, controlling for perceived assistance. Also, perceived assistance did not significantly predict the product consideration probability, partialling out the impact of perceived persuasion. As a result, this analysis did not support that perceived persuasion and perceived assistance will influence the probability of targeted product consideration. This was not consistent with what I found in empirical study 1. Therefore, I ran a supplemental analysis excluding non-persuasion information and persuasion transparency, as well as the content control condition. In this way, I could better compare the results between empirical study 1 and 2. Results from the supplemental analyses revealed that perceived persuasion marginally significantly predicted the probability of a targeted product viewed only. Both perceived persuasion and perceived assistance did not significantly predict the probability of a targeted product compared or considered. Thus, perceived persuasion marginally influenced targeted product view. See Appendix N N.5 for more detail.

Effect	B	Wald χ^2	p	OR	95% CI	
					LL	UL
Perceived persuasion	.09	0.63	.43	1.09	.88	1.37
Perceived assistance	.09	0.63	.43	1.10	.88	.137

Note: $N_{TargetConsideration} = 333$, OR = odds ratio, CI = confidence interval, LL = lower limit, UL = upper limit

Table 217. Binary logistic regression of targeted product selection consideration in empirical study 2

Discussion on persuasion awareness and relevant constructs. The results from the above structural path analyses relatively replicate the results of empirical study 1. Generally, these structural path analyses support the negative effect of perceived persuasion and the positive effect of perceived assistance and agent costs on perceived appropriateness, thereby supporting H1, H2, and H4. Compared with perceived assistance and agent costs, perceived persuasion has a weaker impact. Nonetheless, perceived user costs do not contribute to perceived appropriateness, thus failing to support H3. Additionally, in line with PKM, perceived persuasion influences targeted product selection. That is, when users feel that a website is trying to persuade them, they do not limit themselves to resist it. PKM proposes that individuals who perceive persuasion attempts will make their own goals more salient (Friestad and Wright 1994). This will lead them to respond to the attempts in line with their goals. Thus, they select it if they see fit.

In addition, perceived assistance marginally increases targeted product comparison, thus partially supporting H7. This manifests that when users feel that an online entity is trying to help or benefitting them, they are more likely to compare a targeted product. However, although perceived persuasion does not significantly lead to product consideration, a supplemental analysis indicates that it marginally increases targeted product view, thereby partially supporting H6. In other words, when users perceive persuasion of the website, this does not successfully translate to their careful consideration of the targeted product. Nevertheless, it marginally drives them to view the targeted product in more detail. Consequently, persuasion awareness marginally influences targeted product comparison and view.

N.8   Additional Analyses on Targeted Product Consideration

I conducted the following analyses to evaluate whether perceived persuasion and perceived assistance influenced targeted product comparison, targeted product view, and targeted product consideration, which includes both targeted product comparison and view, for those who received suggestive content and were not exposed to non-persuasion information and persuasion transparency. This better compared the results of empirical study 2 with empirical study 1. I performed binary logistic regression to assess the effect of perceived persuasion and perceived assistance on the three behaviors. Table 218 summarizes the statistics.

Results from logistic regression indicated that perceived persuasion did not significantly predict the probability of a targeted product comparison and consideration, controlling for perceived assistance. Similarly, perceived assistance did not significantly predict the probability of both behaviors, after perceived persuasion was partialled out. However, results showed that perceived persuasion marginally significantly predicted the probability of targeted product view, controlling for perceived assistance. This indicated that the odds of having a targeted product viewed was predicted to increase by a factor of 1.69 per a one-unit increase in perceived persuasion, controlling for perceived assistance. In contrast, perceived assistance did not significantly predict the targeted product view probability, partialling out the impact of perceived persuasion. As a result, these analyses provide some support to the relationship between perceived persuasion and targeted product view only. That is, perceived persuasion increased the probability of a targeted product viewed.

Effect	B	Wald χ^2	p	OR	95% CI	
					LL	UL
Targeted product comparison						
Perceived persuasion	.14	0.30	.59	1.15	.69	1.92
Perceived assistance	.47	2.71	.10	1.60	.91	2.80
Targeted product view						
Perceived persuasion	.53	3.54	.06	1.69	.98	2.93
Perceived assistance	-.17	0.41	.52	.84	.50	1.42
Targeted product consideration						
Perceived persuasion	.29	1.42	.23	1.34	.83	2.15
Perceived assistance	.08	0.11	.74	1.08	.68	1.72

Note: $N_{TargetCompared} = 76$, $N_{TargetViwed} = 76$, $N_{TargetViwed} = 76$, OR = odds ratio, CI = confidence interval, LL = lower limit, UL = upper limit

Table 218. Binary logistic regression of targeted product compared, viewed, and consideration in empirical study 2 (content control, non-persuasion information, and persuasion transparency excluded)