THE USE OF HABIT-CHANGE STRATEGIES IN DEMARKETING:
REDUCING EXCESSIVE DISCRETIONARY CONSUMPTION

by

KATHERINE GALLAGHER

B.A., McGill University, 1978
M.B.A., The University of British Columbia, 1982

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

in

THE FACULTY OF GRADUATE STUDIES
(Faculty of Commerce and Business Administration)

We accept this thesis as conforming
to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA

December 1994

©Katherine Gallagher, 1994
In presenting this thesis in partial fulfilment of the requirements for an advanced degree at the University of British Columbia, I agree that the Library shall make it freely available for reference and study. I further agree that permission for extensive copying of this thesis for scholarly purposes may be granted by the head of my department or by his or her representatives. It is understood that copying or publication of this thesis for financial gain shall not be allowed without my written permission.

(Signature)

Faculty of Commerce

The University of British Columbia
Vancouver, Canada

Date December 19/94
ABSTRACT

According to the Bruntland Commission, sustainable development requires consumers in industrialized nations to reduce significantly their consumption of resources. This research brings a new perspective to the reduction of discretionary consumption, using both theoretical and empirical approaches.

Demarketing programs have often been unable to achieve sustained reductions in consumption. It is argued here that they have incorrectly treated demand reduction as a variation on the usual marketing problem of building demand, when it is (1) more complex than typical marketing problems, and (2) essentially similar to clinical habit change problems.

The dissertation reviews the literature on habits and automated processes, introduces the concept of "habit-like" behavior, and argues that reducing discretionary consumption can often be framed as a habit-change problem.

The Prochaska and DiClemente (1984) Revolving Door Model of Behavior Change (RDM) describes how people change habitual behaviors in clinical situations. Study 1, an energy conservation (cold water laundry washing) survey (n=340), using a decisional balance framework, indicated that the RDM generalizes to demarketing situations and that it is consumers' perceptions of the importance of disadvantages, not advantages, that influence consumption reductions.

The research develops new theory to explain habit-like behavior changes. Based on previous theory and findings on automated processes, it is proposed that changing habit-like behavior proceeds in three steps: de-automation, volitional behavior change, and consolidation. Study 2 was a laboratory experiment (n=117) in which two demarketing approaches (the traditional approach and the habit-change approach) competed in two situations (when the consumption behavior targeted for change was under volitional control, and when it was habit-like). Contrary to expectations, a persuasive message supplemented by limited practice of the new behavior was more effective when
the old behavior was volitional than when it was habit-like, suggesting that the disadvantages of changing are more evident to people whose behavior is habit-like.

There are two important practical implications: that (1) segmentation based on the RDM stages of change may be more powerful than other approaches; and (2) it is more important to address disadvantages of reducing consumption than to emphasize advantages.
# TABLE OF CONTENTS

ABSTRACT .......................................................................................................................... ii

LIST OF TABLES .................................................................................................................. x

LIST OF FIGURES ............................................................................................................... xiv

ACKNOWLEDGEMENTS ...................................................................................................... xv

DEDICATION ......................................................................................................................... xvi

CHAPTER 1
THE ISSUE ......................................................................................................................... 1
   Growth, Consumption, and Marketing ........................................................................... 3
   Sustainability, Conservation, and Demarketing ............................................................ 4
   Overview ......................................................................................................................... 6

CHAPTER 2
MARKETING APPROACHES TO DECREASING CONSUMPTION ............................... 8
   Demarketing .................................................................................................................. 8
   Reverse Marketing ........................................................................................................ 11
   Conventional Marketing ............................................................................................... 14
   Other Variables ............................................................................................................. 17
   Summary ....................................................................................................................... 18

CHAPTER 3
HABITS AND HABIT-LIKE BEHAVIOR ............................................................................. 22
   Habits: A Brief Introduction ....................................................................................... 23
   Historical Overview ..................................................................................................... 23
   Definitions and Descriptions of Habits ....................................................................... 25
   Automatic Processes ..................................................................................................... 30
   Habit-like Behavior ....................................................................................................... 32
   Does Demarketing Attempt to Change Habit-like Behavior? .................................... 34
   Habit-like Behavior in Marketing and Demarketing .................................................... 35
   Summary ....................................................................................................................... 38

CHAPTER 4
A COMPREHENSIVE MODEL OF HABITUAL BEHAVIOR CHANGE .......................... 39
   Why a Psychotherapeutic Model? ............................................................................... 40
   Development of the Model .......................................................................................... 41
   The Linear Version of the Model ................................................................................ 43
      Precontemplation ........................................................................................................ 43
      Contemplation ........................................................................................................... 43
      Action ......................................................................................................................... 44
      Maintenance .............................................................................................................. 44
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>STUDY 1: HYPOTHESES AND DESIGN</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td>General Approach</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td>The Original Decisional Balance Study</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>Hypotheses</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Methodological Approach</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>Criteria for the Target Behavior</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>Object of a Previous Demarketing Program</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>Focus on Changes in Usage Behavior</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>Accuracy in Self-Reports</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td>Behavioral Context: Cold Water Washing</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>Sample</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>Procedure</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>Questionnaire</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>Qualifiers</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>Stages of Change Items</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>Decisional Balance Items</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>Operational Hypotheses</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>Summary</td>
<td>77</td>
</tr>
<tr>
<td>6</td>
<td>STUDY 1: ANALYSIS AND RESULTS</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>Assignment to Stages</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>Decisional Balance Measures</td>
<td>79</td>
</tr>
<tr>
<td></td>
<td>Deletion of Items</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>Principal Component Analysis</td>
<td>81</td>
</tr>
<tr>
<td></td>
<td>Reliability of the Advantages and Disadvantages Scales</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>Cross Sectional Comparisons</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>Treatment of Missing Data</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>Overview of the Cross Sectional Comparisons</td>
<td>88</td>
</tr>
<tr>
<td></td>
<td>Difference Scores</td>
<td>89</td>
</tr>
<tr>
<td></td>
<td>Hypothesis 1</td>
<td>91</td>
</tr>
</tbody>
</table>
Hypothesis 2a .............................................. 92
Hypothesis 2b .............................................. 93
Hypothesis 2c .............................................. 93
Hypothesis 3a .............................................. 94
Hypothesis 3b .............................................. 95
Hypothesis 3c .............................................. 96
Hypothesis 4a .............................................. 97
Hypothesis 4b .............................................. 97
Hypothesis 4c .............................................. 98
Hypothesis 5a .............................................. 99
Hypothesis 5b .............................................. 100
Hypothesis 5c .............................................. 101
Hypothesis 6a .............................................. 102
Hypothesis 6b .............................................. 102
Hypothesis 6c .............................................. 103
Summary of Cross Sectional Results ......................... 104

CHAPTER 7
STUDY 1: DISCUSSION ...................................... 107
Assignment to Stages of Change .............................. 108
  Differential transience .................................. 108
  Low interest level ...................................... 109
  Methodological weaknesses .............................. 110
  A strategy for deciding among the explanations ...... 111
Decisional Balance Measures ............................... 112
Cross Sectional Comparisons ............................... 113
Issues Arising from Study 1 ................................. 117
Issue 1: Definitions of the Stages of Change ............. 118
Issue 2: Dynamic Nature of the Model ................... 123
Issue 3: Fuzzy Borders .................................... 124
Issue 4: The Need for Theory ............................ 125
Summary ..................................................... 126

CHAPTER 8
CHANGING COMPLEX, HABIT-LIKE BEHAVIORS ............ 127
Changing Habit-Like Behavior: An Overview of the Literature 128
  Habit Reversal ........................................ 128
Pre-Emptive Habitual and Habit-Like Behavior Change ........ 131
Decomposing the Habit Change Problem .................... 133
De-Automation ............................................ 134
  Automated processes and habit-like behaviors ........ 135
  Description .......................................... 136
  Reliable anticipation ................................... 138
  Motivation ............................................ 140
Volitional Behavior Change: The Fishbein and Ajzen Approach 141
The Theory of Reasoned Action in a Demarketing Context ...... 143
Consolidation ............................................. 144
CHAPTER 9
STUDY 2: HYPOTHESES AND DESIGN ............................................. 147
Hypotheses ........................................................................ 148
Methodological Approach .................................................. 151
Criteria for the Target Behavior ....................................... 152
Overview of the Procedure .................................................. 153
Pre-manipulation lists .......................................................... 154
Manipulations ..................................................................... 154
Distraction ......................................................................... 154
Post-manipulation lists ......................................................... 154
Questionnaire ....................................................................... 154
Debriefing ......................................................................... 154
Design .................................................................................. 154
Operational Hypotheses .......................................................... 155
Pretests ............................................................................... 159
Procedure ........................................................................... 159
Randomization .................................................................. 159
Preliminaries ....................................................................... 160
Pre-manipulation lists .......................................................... 160
Manipulations ..................................................................... 161
Distraction ......................................................................... 161
Post-manipulation lists ......................................................... 161
Questionnaire ....................................................................... 162
Release ............................................................................... 162
Debriefing ......................................................................... 162
Manipulations ..................................................................... 162
Persuasion + Behavior Manipulation .................................... 162
Persuasion Manipulation ....................................................... 162
Control ............................................................................... 163
Sample ............................................................................... 163

CHAPTER 10
STUDY 2: ANALYSIS AND RESULTS ............................................. 164
Overview of the Data ............................................................. 166
A Note on Terminology .......................................................... 168
Manipulation Check ............................................................. 169
Hypotheses Concerning Groups with Less Premanipulation Task Experience ............................................................................. 172
Assumption 1A .................................................................. 173
Assumption 1B .................................................................. 173
Hypothesis 1A .................................................................... 173
Hypothesis 1B .................................................................... 174
Hypothesis 1C .................................................................... 176
Hypotheses Concerning Groups with More Premanipulation Task Experience .......................................................... 177
Assumption 2A .................................................................. 177
Assumption 2B .................................................................. 177
Hypothesis 2A .................................................................... 177
Hypothesis 2B .................................................. 178
Hypothesis 2C .................................................. 179
Hypothesis 2D .................................................. 180
Hypotheses Concerning the Relative Effectiveness of the Manipulations Across Different Levels of Premanipulation Task Experience .... 180
Hypothesis 3A .................................................. 181
Hypothesis 3B .................................................. 181
Summary of the Experimental Results .................................. 182

CHAPTER 11
STUDY 2: DISCUSSION ........................................ 184
The Experimental Procedure ...................................... 185
Little Pre-Manipulation Practice Groups ......................... 186
  Methodological Issues ....................................... 186
  Theoretical Issue ........................................... 189
Extensive Pre-Manipulation Practice Groups ....................... 191
  Methodological Issues ....................................... 192
  Theoretical Issue ........................................... 192
Relative Effectiveness of the Manipulations Across Pre-Manipulation Levels ........................................... 193
Summary ......................................................... 194

CHAPTER 12
CONCLUSIONS .................................................. 197
Summary of the Dissertation Research .......................... 197
Contributions ................................................... 201
  Theoretical Contributions .................................. 201
  Methodological Contribution .............................. 203
  Practical/Managerial Implications ......................... 204
Limitations ...................................................... 204
  Theoretical Limitations ................................... 204
  Limitations of Study 1 ...................................... 205
  Limitations of Study 2 ...................................... 205
Future Research Directions ..................................... 206
Conclusion ....................................................... 208

APPENDIX 1
BC HYDRO TRACKING SURVEY Wave 7 ..................... 209

APPENDIX 2
MATERIALS FOR PARTICIPANTS IN STUDY 2 .................. 225
APPENDIX 2a: Information Sheet for Participants with Little Premanipulation Practice Receiving the Persuasion Manipulation and Participants with Little Premanipulation Practice Receiving No Manipulation (Control) .......... 226
APPENDIX 2b: Information Sheet for Participants with Little Premanipulation Practice Receiving the Persuasion + Behavior Manipulation ........................................... 228
APPENDIX 2c: Information Sheet for Participants with Extensive Premanipulation Practice Receiving the Persuasion Manipulation ........................................... 230
APPENDIX 2d: Information Sheet for Participants with Extensive Premanipulation Practice Receiving the Persuasion + Behavior Manipulation ........................................... 232
APPENDIX 2e: Consent Form for All Participants .................. 234
LIST OF TABLES

Table 2-1
Review of Demarketing Research ................................................. 20

Table 3-1
Comparison of Conventional Marketing and Demarketing ....................... 37

Table 4-1
Processes of Change ................................................................. 50

Table 6-1
Assignment of Respondents to Stages of Change .................................. 79

Table 6-2
"Disagree" and "Don't Know" Responses in the Decisional Balance Items ........... 80

Table 6-3
Factor Eigenvalues ................................................................... 83

Table 6-4
Rotated and Interpreted Factor Matrix ................................................. 83

Table 6-5
Rotated and Interpreted Factor Matrix When Two Factors Are Extracted ........ 85

Table 6-6
Advantages of Cold Water Washing Scale ........................................... 86

Table 6-7
Disadvantages of Cold Water Washing Scale ....................................... 86

Table 6-8
Means and Standard Deviations of the Advantages and Disadvantages Scales by Stage of Change ................................................ 89

Table 6-9
Ordered Mean Difference Scores By Stage of Change .............................. 91

Table 6-10
Disadvantages and Advantages Scores in the Precontemplation Stage ............ 92

Table 6-11
Disadvantages and Advantages Scores in the Contemplation Stage ................ 92

Table 6-12
Advantages Scores in the Contemplation and Precontemplation Stages ............ 93
Table 10-1
Experimental Procedure and Design .................................................. 165

Table 10-2
Mean Number of Times Participants in Each Group Used Both Sides of the Paper at Various Points in the Experiment .................................................. 167

Table 10-3
Number of Participants Who Switched from Using One Side of the Paper to Using Both Sides ................................................................. 167

Table 10-4
Attitude Toward Using Both Sides of the Paper ........................................... 169

Table 10-5
Student-Newman-Keuls Multiple Range Test for Attitude Toward Using Both Sides of the Paper ................................................................. 170

Table 10-6
Attitude Toward Using Both Sides of the Paper ........................................... 171

Table 10-7
Analysis of Variance: Effectiveness of Manipulations in Producing Favorable Attitudes ................................................................. 171

Table 10-8
Comparison of the Average Number of Times Participants in the Control and Short Persuasion Groups Used Both Sides of the Paper for Lists Immediately Following the Videotape ................................................................. 174

Table 10-9
Comparison of the Average Number of Times Participants in the Control and Short Behavior Groups Used Both Sides of the Paper for Lists Immediately Following the Videotape ................................................................. 175

Table 10-10
Comparison of the Average Number of Times Participants in the Short Persuasion and Short Behavior Groups Used Both Sides of the Paper for Lists Immediately Following the Videotape ................................................................. 175

Table 10-11
Comparison of the Average Number of Times Participants in the Long Persuasion Group Used Both Sides of the Paper for Lists Following the Videotape ................................................................. 178

Table 10-12
Average Number of Times Participants in the Long Behavior Group Used Both Sides of the Paper for Lists Immediately Following the Videotape ................................................................. 179

Table 10-13
Comparison of the Average Number of Times Participants in the Long Behavior Group Used Both Sides of the Paper for Lists Following the Videotape ................................................................. 179
Table 10-14
Comparison of the Average Number of Times Participants in the Long Persuasion and Long Behavior Groups Used Both Sides of the Paper for the Final Ten Lists Following the Videotape ........................................ 180

Table 10-15
Comparison of the Number of Times Participants in the Short Persuasion and Long Persuasion Groups Used Both Sides of the Paper in the Lists Immediately Following the Videotape ........................................ 181

Table 10-16
Comparison of the Number of Times Participants in the Short Behavior and Long Behavior Groups Used Both Sides of the Paper in the Lists Immediately Following the Videotape .... 182
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-1</td>
<td>The Linear Model</td>
<td>43</td>
</tr>
<tr>
<td>4-2</td>
<td>The Revolving Door Model of Behavior Change</td>
<td>47</td>
</tr>
<tr>
<td>4-3</td>
<td>The Spiral Model of Behavior Change</td>
<td>49</td>
</tr>
<tr>
<td>4-4</td>
<td>Processes and Stages of Change</td>
<td>55</td>
</tr>
<tr>
<td>6-1</td>
<td>Scree Plot</td>
<td>84</td>
</tr>
<tr>
<td>6-2</td>
<td>Mean Advantages and Disadvantages Scores by Stage of Change</td>
<td>90</td>
</tr>
<tr>
<td>8-1</td>
<td>Proposed Habitual Behavior Change Process</td>
<td>134</td>
</tr>
<tr>
<td>8-2</td>
<td>Relationship Between Automated Processes and Habit-like Behaviors</td>
<td>135</td>
</tr>
<tr>
<td>8-3</td>
<td>Hierarchy of Automated Processes and Habit-like Behaviors</td>
<td>136</td>
</tr>
<tr>
<td>8-4</td>
<td>Overview of the Theory of Reasoned Action</td>
<td>143</td>
</tr>
</tbody>
</table>
ACKNOWLEDGEMENTS

I extend my thanks to my Research Supervisor, Richard W. Pollay, and the members of my Research Committee, Charles B. Weinberg and Clifton Lee Gass, for their guidance during the course of this research. Their high standards were a continuing challenge. I hope that they are pleased with this work, to which they made such important contributions. I also had a very helpful and constructive Examining Committee, whose other members were Lawrence W. Green, Gerald J. Gorn, Robert E. Sparks, and Ida E. Berger (Queen’s University). They provided valuable advice and perspectives, for which I am grateful.

I would also like to thank Caroline Helbig, who “starred” in the manipulations videotapes, and Brian Tiller, who edited them. Both suffered through inumerable versions and takes with the greatest of patience and good humor.

My colleagues at Memorial University of Newfoundland were unfailingly cooperative as I progressed through this research.

On a more personal note, I would like to acknowledge several people: Jane Londerville and Dave Downie made lunchtimes the high point of my UBC days; Laurenda Daniells helped me retain some perspective; Ellen McIntosh, Judy Cumby, and Dale Foster made me laugh, as well as helping in practical ways. My closest friends, Joanne Lapin and Wanda Parsons, were always willing to listen to me and provide encouragement. My parents, Grace and Paul Gallagher, and my brothers and their wives, Stephen and Donna Gallagher, Ed Gallagher and Teresa Megli (to whose memory this work is dedicated), and Peter Gallagher, were all unbelievably supportive. I thank all of these people. I truly could not have done it without them. Finally, I would like to thank my husband, Jeff Parsons, whose patience, tolerance, good judgement and advice never failed, and whose capacity for encouragement and support was never exhausted.
In Memory of
Teresa Suzanne Megli
(1958 - 1994)
CHAPTER 1
THE ISSUE

From space, we see [the Earth as] a small and fragile ball dominated not by human activity and edifice but by a pattern of clouds, oceans, greenery and soils. Humanity's inability to fit its doings into that pattern is changing planetary systems, fundamentally. Many such changes are accompanied by life-threatening hazards. This new reality, from which there is no escape, must be recognized — and managed. (World Commission on Environment and Development 1987: 1)

For most of this century, in much of the world, growth has been a key economic goal. Economic growth has brought increases in the standard of living and improvements in the quality of life, particularly for people in the industrialized nations of the world. But economic growth is not without cost; in fact, it is becoming obvious that it can come at a very high price, especially with respect to the environment.

Concern about the impacts of economic growth upon the environment started to develop during the 1960s and 1970s (e.g., Carson 1962, Club of Rome 1972, Schumacher 1973). Air and water pollution were regularly in the news; in many jurisdictions, regulations were put in place to limit the harm done by industrial byproducts. By the early 1980s, concern about the environment had expanded and deepened with the recognition that ecological stress brought on by industrial development — degradation of soils, water systems, the atmosphere, and forests — was having an unfavorable impact on economic prospects (e.g., World Commission on Environment and Development 1987). Now, in the 1990s, the economic effects are undeniable, even in prosperous
countries like Canada: for instance, groundfish stocks off Atlantic Canada, once so abundant that the sea was "swarming with fish, which can be taken not only with net, but in baskets let down with a stone," (Environment Canada 1991: 8-4) are so depleted that the Northern Cod fishery has been closed at least until the late 1990s, throwing tens of thousands of Atlantic Canadians out of work.

In 1983, the General Assembly of the United Nations called upon Gro Harlem Brundtland, former Prime Minister of Norway, to chair a special independent commission to propose long term environmental strategies for achieving sustainable development by the year 2000. The Commission's widely discussed final report, Our Common Future, emphasizes the importance of reducing discretionary consumption:

Sustainable development requires the promotion of values that encourage consumption standards that are within the bounds of the ecologically possible and to which all can reasonably aspire. (World Commission on Environment and Development 1987: 44)

Canada supports the recommendations of the Brundtland Commission and recognizes our country's role:

Canadians continue to place greater stresses on the environment than individuals in most of the rest of the world. Progress is evident in the reduction, reuse, and recycling of some materials, but our lifestyle continues to be based on high levels of consumption.

... [O]ur attitudes and actions need to change greatly if we are to successfully build a sustainable Canada for future generations. We will have to become not only better stewards of the environment, but better managers of our own actions and their impacts on the Ecosphere. (Environment Canada 1991: 27-1)

The question is how to change our actions, how to reduce consumption to sustainable levels.

No one piece of research can hope to answer a question of such complexity. Neither can a single discipline. Only the combined efforts of people working on various aspects of the problem from multiple points of view can provide the needed answers. This dissertation research attempts to address, from a marketing point of view, the question of how to reduce discretionary consumption. It does not attempt to solve the whole problem; it is just one brick in the foundation required to build an understanding of the problem. This research proposes and investigates one new approach to
obtaining sustained reductions in discretionary consumption — treating excessive discretionary consumption as a bad habit that needs to be changed. The research reviews literature on demarketing, habits, and habit change; it borrows from psychotherapy a model of behavior change and tests its applicability to a specific demarketing problem, it also develops theory on habit change, and in a controlled experiment, tests some hypotheses derived from the theory.

Before describing the research in more detail, a brief and simplified account of some of the factors that have led to the environmental problems we now face is in order.

**Growth, Consumption, and Marketing**

Ever since the Industrial Revolution, in which production capacity was vastly increased, the normal situation has been one of goods oversupply. For example, in 1910, American factories made seven times as much pig iron as had been produced thirty years earlier in 1880, as well as nine times as much paper, fourteen times as much cottonseed oil, and nearly four times as many railroad cars to transport all the new goods made from these basic materials. In contrast, during that thirty year period, the population of the United States did not quite double (Strasser 1989).

Expansion of demand has been critical to the continued prosperity of industrial economies, and it has been the job of marketing to help develop and nurture new demand. All that pig iron, paper, cottonseed oil, and all those railroad cars found buyers and consumers, and it was marketing that got the goods from the producers to the users.

Thorstein Veblen’s wry observation that "invention is the mother of necessity" might be a suitable motto for marketers, as an unprecedented range and variety of goods and services have been produced and marketed in the last few decades. Thus we in North America have enjoyed a "Consumer Society" for most of this century.
Sustainability, Conservation, and Demarketing

Assuming that the World Commission on Environment and Development is correct in its assessment of the issues, and in its general approach to dealing more effectively with environmental concerns, then excessive consumption will have to be moderated by conservation. Marketing can and should play a key role in achieving sustainable development. However, there is a popular misconception that, since marketing is part of the problem, it cannot be part of the solution. Such a view sells marketing short. In fact, sustainable development will not be possible without effective marketing.

The American Marketing Association defines marketing as:

the process of planning and executing the conception, pricing, promotion, and distribution of ideas, goods, and services to create exchanges that satisfy individual and organizational objectives.

(Bennett 1988: 115)

From a managerial point of view, marketing is much more than getting goods from producers to consumers; it is a matter of demand management: "not only ... finding and increasing demand, but also ... changing or even reducing it" (Kotler, McDougall and Armstrong 1988: 11). Most professional and academic attention has been devoted to understanding how and why demand increases — not surprising, given the prevailing economic conditions in the Western world for the past century. Now that economic and environmental conditions have changed, though, it is appropriate that some attention turn to marketing's capacity to reduce demand.

The process of demand reduction is called demarketing by many academics and demand side management by many marketing practitioners, and reducing demand is not as uncommon a goal as might be expected. For instance:

- Electric utilities encourage energy conservation in order to delay or avoid expensive investment in hydroelectric or thermal generating facilities.
• Canadian public health officials work to persuade people to take care of minor ailments like the "common cold" themselves, rather than going to a doctor, in order to keep health care costs under control.

• Health professionals urge North Americans to eat less fat in order to decrease the incidence of heart disease and some cancers.

• Municipalities want citizens to produce less solid and liquid waste, to reduce the load on the infrastructure.

• Environmentalists try to convince consumers in industrialized countries to reduce their overall consumption of goods in order to keep the planet habitable.

In addition, both permanent and temporary, planned and unplanned product shortages can and do occur, and they must be managed properly in order to mitigate compromising customer satisfaction and firm survival. On a broader scale, economies sometimes face widespread product shortages, through, for instance, war or economic sanctions, as Rwandans, Bosnians, Serbs, Somalis, and Iraqis have recently experienced; or failure of distribution systems, as citizens of the former Soviet Bloc countries have faced lately. In such situations, failure to reduce demand in an orderly and equitable manner has contributed to economic and social chaos.

For reasons as vast as the need for a global commitment to sustainable development to those as specific as one firm's need to address a temporary resource shortage, the processes involved in demarketing are important to understand. Unfortunately, the study of demarketing has largely been neglected in recent years. Consequently, we do not really know how to design effective demarketing programs. This dissertation research is intended to increase understanding, primarily from a theoretical point of view, of how certain types of consumption can be successfully reduced.
Overview

The following chapters explore both theoretical and practical demarketing issues. Chapter 2 begins with a review of past strategies aimed at decreasing discretionary consumption, the results of which have often been disappointing. It argues that a reason for this lack of effectiveness may be that marketing and demarketing are trying to do very different things. A metaphor is employed to elucidate the difference: marketing is like asking consumers to develop new, "good" habits, while demarketing is like asking them to change existing "bad" habits. Furthermore, changing a bad habit is more difficult to do than developing a good habit, for reasons discussed in the chapter.

Chapter 3 examines the question of what a habit is, and whether discretionary consumption can be thought of as a habit. It reviews the literature on habits and proposes a new definition of habits. It also discusses the extent to which discretionary consumption of the type that demarketing programs aim to reduce can be called habitual or habit-like.

The remainder of the dissertation explores empirically and theoretically the implications of conceiving of demarketing as a habit-change problem. Chapters 4, 5, 6, and 7 investigate the utility of borrowing a model of behavior change developed in a psychotherapeutic context. Chapter 4 outlines a model of behavior change developed in a psychotherapeutic setting, an area not typically associated with marketing. It also discusses some of the implications of the model for demarketing. Chapter 5 presents hypotheses and describes the design of an exploratory study intended to explore the degree to which the psychotherapeutic model of behavior change provides a reasonable and useful description of behavior change in a demarketing context. The results of that study are presented in Chapter 6 and discussed in Chapter 7.

Chapters 8, 9, 10, and 11 address the demarketing problem from a more theoretical point of view. Chapter 8 turns to the topic of habit change strategies, deriving theory on what ought to be necessary to change habit-like behavior, based on the cognitive properties of habit-like behaviors. Chapter 9 presents hypotheses based on the theory developed in Chapter 8, and describes the design
of a laboratory study that tests those hypotheses. The results of the laboratory study are presented in Chapter 10 and discussed in Chapter 11.

The final chapter, Chapter 12, reviews the dissertation research, discusses its limitations; identifies theoretical, methodological, and practical implications; draws conclusions; and suggests future research options.
CHAPTER 2
MARKETING APPROACHES TO DECREASING CONSUMPTION

The changes in human attitudes that we call for depend on a vast campaign of education, debate, and public participation. This campaign must start now if sustainable human progress is to be achieved. (World Commission on Environment and Development 1987: 23)

Although the usual emphasis in marketing research and practice is on increasing demand, the issue of decreasing demand has not been ignored. This chapter begins with a review of literature relating to the concept and techniques of demarketing, especially as they relate to energy conservation. It then moves on to an examination of possible reasons for the dearth of consistently effective demarketing programs.

Demarketing

Kotler and Levy (1971) coined the term demarketing in the early 1970s, when the concept of marketing was being broadened beyond its then narrow scope as the art and science of building sales volume through the use of product, price, place (i.e., distribution), and promotion (i.e., communications) variables. They defined demarketing as:

that aspect of marketing that deals with discouraging customers in general or a certain class of customers in particular on either a temporary or permanent basis (Kotler and Levy 1971: 75)
Demarketing is sometimes confused with *countermarketing*. Like demarketing, countermarketing is used to decrease demand, but only in situations where the product is inherently unwholesome; demarketing is used when there is nothing wrong with the product *per se*, but demand is judged to be excessive (though not necessarily by consumers). Consequently, tobacco products have been the subject of countermarketing programs, as tobacco use has been linked to various serious health problems. On the other hand, energy conservation programs fall into the demarketing category: energy, far from being unwholesome, is necessary to sustain human life; it is the *excessive use* of energy that is discouraged. Similarly, the health professions' campaigns to convince North Americans to reduce the amount of fat in their diets is an example of demarketing, as some fat — though much less than North Americans typically consume — is necessary in a healthy diet. Once again, it is the *excessive consumption* of fat that is undesirable, not the fat itself.

Kotler and Levy identified four types of demarketing: *general* demarketing, required when the goal is to reduce total demand; *selective* demarketing, used to discourage demand from certain customer segments; *ostensible* demarketing, in which the appearance of discouraging demand is actually a device for increasing it; and *unintentional* demarketing, where inept marketing programs aimed at increasing demand actually drive customers away. Subsequent research efforts have not focused on ostensible or unintentional demarketing, as neither is aimed at demand reduction, and might more properly be called *pseudo* demarketing. Rather, they concentrate on what might be called *true* demarketing problems.

Table 2-1, which appears at the end of this chapter, gives a brief description of the purpose, approach, and, where applicable, results of demarketing studies appearing in the literature from 1971, when Kotler and Levy first defined and described demarketing, to the present. The table presents the studies in chronological order, to show how the literature has developed over time. During the 1970s, a decade in which concerns about energy supplies were particularly high, most studies focused on strategic responses to shortages outside the firm's control (Blankenship and Holmes 1974, Cravens
1974, Cullwick 1975, Hanna, Kizilbash, and Smart 1975, Kotler 1974, Shama 1978). Kotler and Levy's basic prescriptions — raise prices, restrict consumer access to the product, reduce product quality, and cut back on promotion — were elaborated upon. However, no empirical verification of the effectiveness of this approach was undertaken. (Shama 1978 did provide empirical data, but its purpose was to identify strategic options that had been used, not to assess their efficacy.) The interest in strategies to cope with supply constraints continued into the 1980s (Bellur 1980, Dadzie 1989, Papadopoulos 1983). In the late 1970s and through the 1980s, the demarketing literature broadened to include the effects of demarketing programs on consumer attitudes (Frisbie 1980, Kelley and Scheewe 1975, Reddy 1989) and societal concerns about ecology (Shapiro 1978), the new economic world order, and changing consumer values (Van Dam 1978). During the 1980s, empirical work was relatively more common than it had been in the previous decade (Dadzie 1989, Frisbie 1980), but the purpose was still primarily descriptive, rather than aimed at understanding the underlying processes.


The next two sections of this chapter give detail on the types of strategies recommended by demarketing experts. The first section reviews literature on what is referred to in this research as "reverse marketing"; the second reviews literature on the use of "conventional marketing" techniques in demarketing contexts.
Reverse Marketing

The assumption underlying many demarketing prescriptions is that reduction in demand can be accomplished by raising prices, and reducing product quality, service, promotion, and convenience (a strategy advocated in Kotler and Turner 1981). Based on an economic model, this "reverse marketing" is a plausible and intuitively appealing approach to the problem of reducing discretionary demand. A fundamental concept in microeconomics is that changes in price will affect the quantity demanded: lowering prices increases the quantity demanded, and raising prices lowers the quantity demanded. Similarly, reducing product quality, service, promotion, and convenience should lower the quantity demanded. Unfortunately, however, reverse marketing has not always been as effective as might be expected.

Consider the case of energy conservation — per capita consumption reduction — an area identified by the World Commission on Environment and Development (1987) as a key to sustainable development. Energy conservation, to which a variety of reverse marketing strategies have been applied, is one of the few well-documented demarketing problems. For almost two decades, government, the energy industry, and the environmental movement, faced with unstable and depleting energy supplies, have been actively encouraging conservation. While recent improvements in energy efficiency and a shift in the economy toward less energy intensive sectors have limited increases in consumption, results on a per capita basis have been disappointing.

Two reverse marketing techniques, raising prices and restricting supplies, have been used to encourage consumers to reduce their demand for energy. In their review of energy conservation policies and programs, Ritchie and McDougall (1985) suggest that the reason these strategies lack effectiveness, at least in the short run, is that demand for energy in the short term is relatively inelastic. They conclude that without dramatic price increases, only minimal reductions in energy use can be expected. In the same vein, Stern's (1986) review of the energy conservation literature indicates that people do not always notice economic signals because their information about the costs
associated with various energy-use actions is incomplete and systematically inaccurate. He calls the economic assumption that price increases will yield energy savings "simplistic". Other authors (Claxton 1989, Heberlein and Warriner 1983) suggest that for short periods following significant price increases, consumers take active steps to reduce their demand for energy; however, as they become accustomed to higher prices, they return to old consumption patterns. Reverse marketing techniques other than pricing are even less successful. For example, consumer resistance to restrictions of supply (such as odd-even days for gasoline purchases) is high, and increases with the severity of the restrictions (Ritchie and McDougall 1985).

Why does reverse marketing not yield aggregate decreases in consumption? One possibility is that there is no further potential for conservation. This seems unlikely. In fact, some researchers suggest that conservation efforts could reduce consumer consumption by as much as 40% (Gray and von Hippel 1981, Sawhill 1979, Stern and Gardner 1981).

Another possibility is that the incentives to conserve are not strong enough, given income distribution in North America. Ritchie and McDougall (1985) conclude that high-income households are likely not to change their consumption patterns in response to price increases; middle-income households are likely to maintain their energy use behavior, but invest in energy efficient appliances and cars; while low-income households, lacking the financial resources to invest in energy efficiency, will change their lifestyles to curtail energy use. And the middle-income strategy of reducing consumption by investing in energy efficient plant, rather than by attempting to decrease wasteful behavior, may actually be counterproductive, leading to increases in consumption. It may be that people have the perception that investment in conservation devices frees them from having to take any other actions to conserve, including conservation actions they may already have undertaken.

Claxton (1989) provides a vivid example. Although gasoline consumption per car decreased almost 18% in the U.S. between 1973 and 1982, and gasoline efficiency improved by 12%, actual gasoline consumption increased slightly (1.1%) — due to a per capita increase in the number of cars. Of
course, this is correlational data, so no causal inferences can properly be drawn; nevertheless, it is clear that investment in efficiency does not necessarily coincide with conservation.

Several researchers in economics (e.g., Etzioni 1986, Deaton and Muellbauer 1980, Katona 1975) suggest that "habit persistence" may account for the observed short run insensitivity of consumption to changes in price (several examples of which are given by Thurow 1983). Katona describes habit persistence this way:

Habitual behavior occurs much more frequently [than problem solving behavior] and, whatever the origin of our habits, they do not exhibit the major features of rational behavior. People act as they have acted before under similar circumstances, without deliberating and choosing. Routine procedures and the application of rules of thumb by consumers as well as businessmen [and/or businesswomen] exclude the weighting of alternatives (Katona 1975: 218-219).

Most explanations for habit persistence relate to various financial and temporal costs associated with finding good substitutes for the commodity in question; here, of course, that would be energy. However, demarketing energy involves reducing discretionary demand, not simply converting demand for one type of energy to demand for another — unless the switch causes a net decrease in energy consumed.

Deaton and Muellbauer (1980) offer one explanation for habit persistence that does seem to fit the energy conservation situation: tastes may be affected by previous consumption experience. These authors suggest that people do not look ahead to future effects when making certain types of decisions; rather, they look back at what they have done before. Thus, consumers are more likely to be driven by their past patterns of energy consumption than by their anticipation of the consequences those consumption patterns might have. Possibly this occurs because of the relative sizes of North American households and the economies within which they operate. Each household is so small that it can safely ignore the feedback from its actions through group actions back to its own preferences.
Etzioni (1986) suggests another explanation for habit persistence, based on the observation that rational behavior requires considerable effort and high costs: information on each of the alternatives must be collected and used in decision making. In contrast, habitual consumption behavior requires no cognitive work, preparation, development, or adaptation. Consequently, routine changes in prices, wages, tax incentives and the like are unlikely to have an effect because it is just too costly, from both cognitive and financial points of view, to make the behavioral adjustments that a narrow economics-based definition of "rationality" would demand.

To summarize, the literature related to reverse marketing suggests that the disappointing results of these techniques may be a matter of habit persistence, or the perception that investment in conservation devices frees the investor from having to take any other actions to conserve, or simply that household income in North America is so high that the conservation incentives offered so far are simply not strong enough. The reasons are not perfectly understood, but these suggestions, especially when taken together with what we know about the results of conventional marketing techniques on the same problem, which will be discussed in the next section, provide insight into the unique challenges demarketing problems offer.

Conventional Marketing

Conventional marketing programs, based on the assumption that behavior change is the result of changes in relevant attitudes, have also been used in demarketing situations, notably in energy conservation. Numerous educational and promotional campaigns have been designed to raise awareness of the need for energy conservation and to increase knowledge of appropriate conserving behaviors. Results have been mixed, a sort of "good news, bad news" situation.

The good news is that there has been a marked change in awareness and attitudes — North Americans are aware of the energy problem and have positive attitudes toward conservation (Keller and McDougall 1981, Milstein 1977, Mittelstaedt 1991, Olsen 1981). Furthermore, they report

The bad news is that the aggregate energy consumption data do not show an appreciable per capita decrease (Claxton 1989), despite technical improvements that increase energy efficiency in many products. In other words, people seem to think energy conservation is a good idea, they want to do it, they think they are doing it, but whatever they are doing is not enough, or it is not being done consistently enough by large enough numbers of consumers to affect significantly the overall demand for energy. This discrepancy between attitudes and behavior is not confined to energy use; it is also evident in other environmental issues such as solid waste, air quality, and recycling (Mittelstaedt 1991).

Attitude-behavior inconsistency is not a problem unique to demarketing situations; it has plagued behavior change theorists for years. Wicker (1969), in a review of studies attempting to link attitudes and behavior, concluded that "it is considerably more likely that attitudes will be unrelated or slightly related to overt behaviors than that attitudes will be closely related to actions" (Wicker 1969: 68).

Once again, the question is why? The explanations are well known and summarized concisely and coherently by Fishbein and Ajzen (1975). They outline two different explanatory approaches. The "other variables" explanation is based on the assumption that attitudes are related to behavior, but that additional variables, acting either independently or as moderators, must be considered if behavior is to be predicted accurately. For instance, beliefs about the efficacy of detergents in cold water might mediate the relationship between attitudes concerning cold water washing and the actual behavior; they might also affect the behavior directly. In fact, Fishbein and Ajzen propose that the attitude-behavior relationship is always mediated, by "behavioral intention," an individual's subjective estimation of the probability that he or she will perform the behavior.
Fishbein and Ajzen also outline a "measurement" explanation. They propose that three major factors influence the magnitude of the relationship between intention and behavior. The first is correspondence in levels of specificity: the degree to which the intention is measured at the same level of specificity as the behavior to be predicted. Thus a person's performance of a particular behavior, say washing this week's laundry in cold water, is determined by his or her intention to perform that particular behavior at that particular point in time, rather than his or her more general intention to conserve energy.

The second measurement-related factor influencing the magnitude of the relationship between intention and behavior is the stability of the intention. The longer the time interval between the measurement of the intention and the performance of the behavior, the greater the chance that the individual will receive new information that could affect his or her intention. Frequently, the behavior can occur only after a sequence of other behaviors has been executed. The greater the number of intervening steps, the lower the intention-behavior correlation will be. For example, someone might intend to do the next dishwasher load only when the machine is full. If that person then impulsively invited guests for supper, he or she might run the dishwasher half full in order to clear it before the guests arrive, thereby seeming to be inconsistent; actually the problem is that the intention was measured too far in advance of the performance of the behavior.

Both the "measurement" and "other variables" explanations of attitude-behavior inconsistency are well known and well understood, and have been for years. In fact, many undergraduate social psychology textbooks (e.g., Baron and Byrne 1984) devote several paragraphs to this issue. This widespread understanding of the pitfalls of attitude-based behavior change programs, plus the very large number of energy conservation programs that have been designed and implemented by capable and competent professionals, suggest that it is unlikely that these explanations can completely account for the consistently disappointing results in terms of long term curtailment (as opposed to efficiency) behaviors. In fact, there is another explanation.
A third factor influencing the magnitude of the relationship between intention and behavior has often been overlooked, but it may be critical in understanding the failure of attitudes to predict behavior in a demarking context like energy conservation. This third factor is volitional control: attenuation in the intention-behavior relationship may be due to lack of ability or resources, or it may be due to "force of habit." The latter possibility is particularly relevant.

Fishbein and Ajzen highlight the difference between habitual behaviors and those under volitional control:

Although a person may intend to do one thing, by "force of habit" he [or she] does something else. Before leaving home, a person may intend to try a new route to his [or her] office, but later finds himself [or herself] driving along the same route he [or she] takes every day. In fact, many well-learned skills (e.g., playing the piano, driving a car) are performed almost automatically without much conscious effort. Most behaviors of interest to social scientists, however, do not involve such automatic sequences of motor responses. Instead, investigators attempt to predict a person's decisions, participation in various activities, purchasing behavior, voting for political office, and interactions with other people. We have argued that these kinds of behaviors are under volitional control and thus can be predicted from the person's intentions. (Fishbein and Ajzen 1975: 371) (Emphasis added.)

Likewise, Janis and Mann (1977) explicitly exclude from their study of decision making the "endless round of minor, routinized decisions a person faces when he looks over a menu in a restaurant, [or] selects a movie" (Janis and Mann 1977: 4) in favor of more substantial decision making.

Thus, to the extent that the behavior of interest is like a habit, conventional behavior change theories alone are likely to be inapplicable. If demarking problems such as energy conservation involves changing habitual or habit-like behavior, then it will be necessary to look beyond social psychological theories of behavior change that assume volitional control.

Other Variables

This chapter has argued that habits or habit-like behaviors may play an important part in the success or failure of demarking programs. Consequently, habits and habit-like behaviors are the
focus of the theory and empirical work developed in this dissertation research. Note, however, that other variables may also affect significantly the power of demarketing programs. There is, for instance, a considerable body of research on altruism and prosocial behavior (e.g., Clark 1991) that may offer insight: it seems reasonable to expect that the degree of altruism (or, conversely, selfishness) may influence individuals’ propensity to reduce discretionary consumption. Selfish people would presumably be less willing than altruistic people to reduce their discretionary consumption, unless the benefits of doing so accrued to themselves, directly or indirectly. Similarly, the literature on time orientation (e.g., Block 1990, Hoch and Loewenstein 1991) may suggest other useful variables, such as the way individuals discount time. People who strongly value the present over the future may be unwilling to make sacrifices now to prevent future hardships, even if they themselves will have to bear those hardships.

While these variables (and others) are interesting and potentially powerful in understanding demarketing, they are beyond the scope of this research.

Summary

Although marketers usually seek to increase demand for their products and services, sometimes they want to reduce demand — to demarket. During the 1970s, mostly in response to the Energy Crisis, a small literature on demarketing developed, most of which is applied in its focus and prescriptive in nature. As Table 2-1 indicates, empirical validation was apparently not a priority.

The best-documented demarketing problem is that of energy conservation. Two kinds of strategies, "reverse marketing," based on microeconomic theory, and "conventional marketing," based on social psychological theories of attitude and behavior change, have been used in attempts to reduce demand for energy. Reviews suggest that both types of strategies have been relatively ineffective, at least in the short run. This is somewhat surprising, since it is not obvious why either type of strategy should be less effective when the aim is curbing rather than building demand. However,
closer examination of the theories on which those strategies are based reveals that a key assumption is not being met: that the behaviors being influenced be volitional. If a consumption behavior is habitual or habit-like, those theories may not apply. This may explain some of the disappointing results of both reverse marketing and conventional marketing strategies aimed at reducing discretionary consumption, such as the insensitivity of demand for energy to price increases, and the attenuated attitude-behavior relationship in energy conservation.

The next chapter examines the feasibility of viewing the demarketing problem as analogous to a habit change problem, and then elaborates on some of the ramifications of this conceptualization of the problem.
<table>
<thead>
<tr>
<th>Article</th>
<th>Purpose</th>
<th>Approach/Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kotler and Levy 1971</td>
<td>Definition and description of demarketing</td>
<td>Classification and prescriptions for managerial action based on anecdotal evidence; no empirical verification</td>
</tr>
<tr>
<td>Blankenship and Holmes 1974</td>
<td>Questioning whether the marketing concept will survive a sellers' market</td>
<td>Informed speculation on the implications of shortages on the buyer/seller relationship; no empirical verification</td>
</tr>
<tr>
<td>Cravens 1974</td>
<td>Development of strategy guidelines for firms facing raw material and/or product shortages</td>
<td>Identification of marketing strategy situations based on combination of resource constraints and trend in market demand; no empirical verification</td>
</tr>
<tr>
<td>Kotler 1974</td>
<td>Examination of the role of marketing during a period of shortage</td>
<td>Strategy prescriptions based on literature review and informed speculation; no empirical verification</td>
</tr>
<tr>
<td>Cullwick 1975</td>
<td>Development of strategy guidelines for firms facing excess demand</td>
<td>Identification of marketing strategy options based on marketing objectives and marketing mix priorities; no empirical verification</td>
</tr>
<tr>
<td>Hanna, Kizilbash, and Smart 1975</td>
<td>Development of strategy guidelines for firms facing raw material shortages</td>
<td>Identification of marketing strategy options by marketing mix element; no empirical verification</td>
</tr>
<tr>
<td>Kelley and Scheewe 1975</td>
<td>Description of effect of shortages on consumer decision making</td>
<td>Literature review of behavioral economics</td>
</tr>
<tr>
<td>Shama 1978</td>
<td>Development of strategy guidelines for firms facing shortages, inflation and recession</td>
<td>Identification of marketing strategy options by marketing mix element, based on surveys of marketing managers (n=104) and consumers (n=969)</td>
</tr>
<tr>
<td>Shapiro 1978</td>
<td>Examination of the role of marketing in a world of increased ecological concern and resource shortages</td>
<td>Discussion of the ramifications of a &quot;conserver society&quot;</td>
</tr>
<tr>
<td>Article</td>
<td>Purpose</td>
<td>Approach/Results</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Van Dam 1978</td>
<td>Examination of the role of marketing in a world of resource shortages, new consumer values, and a new economic world order</td>
<td>Discussion of the ramifications of changes in the business environment; discussion of how cooperative action by marketers can address the waste management problem</td>
</tr>
<tr>
<td>Monroe and Zoltners 1979</td>
<td>Examination of criteria for pricing the product line during periods of scarce resources</td>
<td>Development of an analytical model showing that profits are largest when &quot;contribution per resource unit&quot; is maximized; no empirical verification</td>
</tr>
<tr>
<td>Bellur 1980</td>
<td>Examination of the effectiveness of various policy options to curtail gasoline consumption</td>
<td>Regression model suggests a decrease in automobile weight, elimination of gas guzzling gadgets (e.g., air conditioning), and either avoiding higher prices or instituting a two-price policy</td>
</tr>
<tr>
<td>Frisbie 1980</td>
<td>Examination of the role of demarketing in dealing with the energy crisis</td>
<td>Exploratory study (n=303) on attitudes concerning the energy crisis and energy-related consumption behavior yielded four psychographic profiles after factor analysis</td>
</tr>
<tr>
<td>Papadopoulos 1983</td>
<td>Examination of the major types of demarketing situations as well as the parameters that will determine appropriate demarketing strategy</td>
<td>Development of framework for shortage analysis</td>
</tr>
<tr>
<td>Dadzie 1989</td>
<td>Examination of how firms in selected African firms apply demarketing in a sellers' market environment</td>
<td>Survey of selected Third World firms (n=188) found three forms of sellers' markets, each using different types of demarketing strategies</td>
</tr>
<tr>
<td>Reddy 1989</td>
<td>Recommendation that employers can reduce health care costs by demarketing employee health benefits</td>
<td>List of advantages and disadvantages of traditional cost-reducing methods and demarketing methods; no empirical verification</td>
</tr>
</tbody>
</table>
CHAPTER 3
HABITS AND
HABIT-LIKE BEHAVIOR

Living standards that go beyond the basic minimum are sustainable only if consumption standards everywhere have regard for long term sustainability. Yet many of us live beyond the world’s ecological means, for instance in our patterns of energy use. Perceived needs are socially and culturally determined, and sustainable development requires the promotion of values that encourage consumption standards that are within the bounds of the ecologically possible and to which all can reasonably aspire. (World Commission on Environment and Development 1987: 44)

The previous chapter's review of demarketing programs and their underlying assumptions offered a number of possibilities to explain why most programs seem unable to reduce discretionary consumption significantly and consistently over time. Among the possibilities is the idea that the demarketing strategies typically used (i.e., reverse and conventional marketing strategies) assume volitional control on the part of the consumer when, in fact, it is not clear whether discretionary consumption is always volitional. If and when it is habitual, those strategies may not be the most appropriate. That possibility is explored more fully in this chapter and the next.

This chapter examines the question of what a habit is, and whether discretionary consumption can be thought of as a habit. It begins with an historical overview of the literature on habits and a discussion of the definitions and descriptions which have appeared in general reference dictionaries, economic theory, and psychological research. It then proposes a new definition of habits. Since that definition highlights the role of automaticity in habitual behavior, there is also a summary of research
on automatic processes, highlighting the relative nature of automaticity. It is then suggested that the concept of a habit is also relative, and a definition of habit-like behavior is provided. The chapter concludes with a discussion of the extent to which discretionary consumption of the type that demarketing programs aim to reduce can be characterized as habit-like.

Habits: A Brief Introduction

As Fishbein and Ajzen (1975) and Janis and Mann (1977) point out, social psychologists have been interested mostly in volitional behavior, behavior that is the result of conscious choice. The study of what would commonly be thought of as habits — consistent patterns of action (or thought), acquired by frequent repetition and demanding little or no attention — has not been a priority, despite the fact that habits govern much of our daily lives.

Most people have many routines that they follow without much thought, such as brushing their teeth after meals, getting to and from work every day, answering phone messages after meetings, watching the evening news on television, doing the laundry and grocery shopping. In the normal course of events, they rarely, if ever, consider alternative courses of action, and pay little or no attention to these activities. To the extent that such routines involve frequently repeated behaviors requiring little attention (unless there are disruptions to the expected stream of behavior and consequences, in which case they may receive considerable attention), they can be called habits.

Historical Overview

In the early days of social psychology, habits were considered by prominent researchers to be a central issue. Over 100 years ago, William James, in his classic work, Principles of Psychology (1890), described the origins and consequences of habits, and distinguished between habits and conscious decisions. John Dewey, in the preface to his book, Human Nature and Conduct (1922), stated that "an understanding of habit and of different types of habit is the key to social psychology."
By 1932, Knight Dunlap, in *Habits: Their Making and Unmaking*, was able to reflect on 50 years of "rapid growth in the study of habit formation" (Dunlap 1932: viii). Behaviorist psychologists like C.L. Hull (1943) considered habits and their formation to be a very important issue. Social psychologists, however, were much less interested in habits. But by the late 1920s and early 1930s, when Thurstone and Likert started to publish their seminal work on attitudes (Likert 1932, Thurstone and Chave 1929), the focus in social psychology was shifting away from habits (Mixon 1980). The study of attitudes has dominated social psychology since the 1950s (Tesser and Shaffer 1990); during this period, social psychological research on habits has been, until recently, virtually non-existent.

Lately, however, habit has re-entered the picture. Researchers examining the attitude-behavior relationship have been questioning how often people rationally consider alternatives in deciding what course of action to take. Tesser and Shaffer (1990), in their review of recent literature on attitudes and attitude change, cite research showing that people frequently behave on the basis of "automatically activated attitudes". Ronis, Yates and Kirscht (1989), in a review of the influences on repeated health-related behaviors (i.e., repeated behaviors that have clear positive or negative effects on health), conclude that repeated behaviors are usually determined largely by habits rather than by attitudinal variables, although attitudes are central to the formation and modification of habits. In an empirical study, Mittal (1988) found that habits (both pro- and anti-intentional) are significantly related to seat belt use, even after the effects of attitude are taken into account. On the theoretical side, Triandis (1979) explicitly included habits in his theoretical framework explaining the relationship of attitudes, values, and "other acquired behavioral dispositions" to behavior.

Researchers in economics are also paying increasing attention to habits, due mostly to their closer examination of two issues, rationality and the independence of behavior over time. The discipline of economics focuses on "rational human behavior," where *rational behavior* is defined as "nothing more than action well-suited to achieve your goals, within your limitations and capacities" (Hirshleifer 1976: 7). Habits, particularly "bad" habits, have traditionally been thought of as
"irrational" and therefore outside the domain of economics. However, Becker and Murphy (1988) were able to show analytically that addiction (the most extreme form of a bad habit) is, in fact, a rational phenomenon. In addition, economists have been re-examining the assumption that choices today are independent of choices in the past. Becker (1992) points out that, despite the fact that this assumption was criticized as early as 1965, it discouraged economists from grappling with significant issues such as habits, addictions, and traditions until relatively recently.

Part of the problem for both psychologists and economists may also be that a satisfactory definition of "habits" is elusive.

Definitions and Descriptions of Habits

Given that most people would claim that they are familiar with both the concept and the experience of habits, it is surprisingly difficult to find or develop a definition that is broad enough to encompass the many instances of behaviors that people would call "habits," yet specific enough to be operationalized in a research setting.

Dictionary definitions capture many of the connotations associated with the everyday definition of habits. *The Random House Dictionary of the English Language* (1983) lists no less than seven relevant definitions:

habit (hab’it), n. 1. customary practice or use: Daily bathing is an American habit. 2. a particular custom, practice, or usage: the habit of shaking hands. 3. compulsive need, inclination, or use; addiction: liquor habit; drug habit. 4. a dominant or regular disposition or tendency; prevailing character or quality: She has a habit of looking at the bright side of things. 5. Slang. an addiction to narcotics (often prec. by the). 6. an acquired behavior pattern regularly followed until it has become almost involuntary: the habit of looking both ways before crossing the street. 7. mental character or disposition: a habit of mind. (*Random House Dictionary of the English Language* 1983: 634)

These definitions accomplish their primary purpose, to provide general information on meaning, pronunciation, spelling, usage, and etymology, but they present problems for empirical research.
Words and phrases like "customary", "compulsive", "regular", and "almost involuntary" are imprecise, context-specific, and subjective. In short, they are difficult to operationalize. Several researchers have attempted to overcome these problems by crafting definitions in terms reflecting the perspectives of the research traditions within which they work.

From the consumer behavior point of view, Assael (1992) offers this definition:

Habit can be defined as repetitive behavior resulting in limitation or absence of (1) information seeking and (2) evaluation of alternative choices. Learning leads to habitual purchasing behavior if the consumer is satisfied with the brand over time. After repetitive purchases, the consumer will buy the brand again with little information seeking or brand evaluation. (Assael 1992: 79).

This is a useful definition, as it not only emphasizes the role of repetition in habits, but also highlights an important attribute of habitual behavior, that it limits consideration of other alternatives. As long as the system in which the habit is operating remains stable, this limitation is no disadvantage, but if circumstances change, a habit can reduce the individual’s effectiveness in responding. People often stick to the old ways of doing things when new alternatives may be superior (although when challenged, they usually have a rationalization). For instance, in may areas, commuters cling to their cars when taking the bus would save them both time and money. One of the reasons may be that they have a habit of driving to and from work, developed when traffic congestion was not as severe, bus lanes were rare, and downtown parking rates were not as high, and they never seriously consider public transit (though, when challenged, they may provide an elaborate rationalization, in which "freedom" probably figures prominently). So, this definition points out the "stickiness" of habitual behavior, and attributes it to lack of consideration of alternatives. This is a useful insight, but it does not capture the full character of habits. Other definitions, from other points of view, provide additional information.

Becker (1992) presents an economic definition: habitual behavior displays "a positive relation between past and current consumption" (Becker 1992: 328). For most goods, consumption at time $t_i$ will lead to reduced consumption at time $t_{i+1}$, as long as the time intervals are short and the
quantities consumed are large enough. (Note that "short" and "large enough" share the imprecision, context-specificity, and subjectivity of the dictionary definition.) For instance, half an hour after drinking a litre of water, most people would have little desire to drink more. But for many goods, when \( t_i \) and \( t_{i+1} \) are not close together, consumption at time \( t_i \) stimulates increased rather than decreased consumption of the good at time \( t_{i+1} \). Under these circumstances, a habit is said to be operating. For instance, while most people would not want another bowl of cereal immediately after having eaten one, they might want one the next morning. When this occurs every day (i.e., for every \( t_i \) and \( t_{i+1} \), where the interval between \( t_i \) and \( t_{i+1} \) is one day), then the person can be said to have a habit of eating cereal for breakfast. Likewise, while one might not want a heavy brunch every morning, it could become a habit to have it every Sunday morning (i.e., the interval between \( t_i \) and \( t_{i+1} \) is one week).

Becker's (1992) definition is useful for two reasons. First, it highlights the fact that for habits, current consumption is not independent of past consumption. Second, it specifies the nature of the nonindependence, allowing economists to explore the implications of habitual behavior. For example, Becker and Murphy (1988) are able to demonstrate that addiction, the strongest form of habit, previously regarded in economics as completely irrational, can actually be quite rational; and Becker, Grossman, and Murphy (1991) have looked at the effect of price on consumption in rational addiction. The problem with this definition is that, while it may be adequate to obtain analytical results, it is not very useful for empirical research, as the relevant time intervals would vary by both good and individual.

Becker makes another contribution, by distinguishing between "good habits" and "bad habits." We make this distinction regularly in everyday life — good habits, such as regular exercise, are those that we believe will lead to benefits such as better health and longer life; and bad habits, such as wasteful use of energy, will have detrimental effects in the future, such as higher bills and
environmental degradation. (Surprisingly, none of the psychological literature reviewed had anything
to say about good and/or bad habits.) Becker (1992: 328) says:

Habits are harmful or "bad" if greater present consumption lowers
future utility, as in the detrimental effects on future health of heavy
smoking or drinking. Similarly, habits are beneficial if greater
present consumption raises future utility; regular swimming or
regular church attendance may be examples.

There is considerable variability in the definitions used in psychology. Some authors use
definitions similar to those given in general purpose dictionaries. Mixon (1980) describes habits as
"physical, emotional and cognitive ways of behaving" (Mixon 1980: 178); "a characteristic way a
person behaves" (Mixon 1980: 183); and "organized, skill-like ways of behaving" (Mixon 1980:
184). Verville (1988) defines a habit as "a learned way of behaving: a pattern of acting, thinking,
or feeling that has become routine" (Verville 1988: 3). These characterizations of habits may be
adequate for some purposes, but they have limited utility in an empirical setting, as they would be
difficult to operationalize. Fortunately, a number of authors provide additional detail.

A concise and coherent definition is provided by The Penguin Dictionary of Psychology
(Reber 1985), in which habitual behavior is defined as "patterns of activity that have, through
repetition, become automated, fixed and effortlessly carried out" (Reber 1985: 314). Note that the
requirement for repetition is consistent with the economic definition of habits. Other definitions are
more descriptive. Triandis (1979) defines habits as:

situation-specific sequences that are or have become automatic, so
they occur without self-instruction. The individual is not usually
"conscious" of these sequences. . . . Habits require learning . . .
Certain cognitive schemata [are habits] . . . They are elicited by
patterns of stimuli, and a consequence of their activation often
includes a complex sequence of behavior. (Triandis 1979: 204)

Mittal (1988) elaborates on the unconscious nature of habits, referring to them as recurrent or
repeated behavior that occurs without awareness: "awareness is the discriminating characteristic"
(Mittal 1988: 997). Based on this requirement, Mittal argues that "habits" such as brushing one's
teeth are not necessarily habits at all, because although the behavior occurs repeatedly, and one can
develop stable patterns of activity (and this is certainly necessary for a behavior to be considered a habit), "if the behavior recurs with awareness, it must be deemed as being driven by intentions, or self-instruction, not habit" (Mittal 1988: 997). According to this definition, then, habit-driven behavior presupposes a lack of awareness of plans and self-instructions about the act and of the act itself — during the actual performance of the behavior. Consequently, wearing a seat belt would be classified as being a habit if one were unaware of putting on the seat belt at the moment it is being put on. Subsequent awareness of the behavior is allowed. In fact, for Mittal's study, ex-post awareness is necessary, as the measures of habit depend on self-reports.

The definition of habits provided by Ronis, Yates, and Kirscht (1989) is largely in line with both Mittal (1988) and Triandis (1979):

Habits are the results of automatic cognitive processes. Such processes develop by extensive repetition. Automatic processes are so well-learned that they do not require conscious effort. Automatic processes are unintentional. They are typically set in motion by stimulus cues. Automatic processes can go on simultaneously with other cognitive processes without any interference. We are often unaware of automatic processes. (Ronis, Yates, and Kirscht 1989: 219)

Unlike Mittal (1988), however, these authors would not exclude teeth-brushing from the habit category. "Most adults, for example, brush their teeth at one or more specific times during the day, without a daily consideration of whether or when to do it" (Ronis, Yates, and Kirscht 1989: 220). Here, the lack of awareness applies to the decision to brush one's teeth, rather than the actual act of doing so.

The distinction between the behavior and the decision to behave is important. It suggests that habits may be the result of automation in either decision making or behavior (or both). Thus the domain of habits includes not just habitual behavior, but habits of thought and decision. To reflect this, the definition of habits proposed in this research, Definition 3.1, is based on the Reber (1985) definition, but explicitly recognizes that habits are not confined to behaviors, although they may be
manifest as behavior. In addition, it is compatible with the economic definition of habits, as it highlights the role of repetition in the establishment of habits.

**Definition 3.1**

A habit is a pattern of activity (behavior, decision, perceptual bias, etc.) that has, through extensive repetition, become automated, fixed, and effortless, and occurs without conscious awareness or consideration of alternatives.

At the core of a habit is a set of "automated activities." In order to understand habits, it is necessary to understand these activities which are called "automatic processes" in cognitive psychology.

**Automatic Processes¹**

Cognitive psychologists have shown that the execution of a complex behavior requires the coordination of many component subskills (LaBerge and Samuels 1974). Given the capacity constraints on the human cognitive system, and the fact that many complex behaviors require both simultaneous and sequential processing and/or performance of various component subskills, it is clear that most complex behaviors could not be executed if each process required attention. Some of the component processes therefore become "automatic." Automatic processes, in contrast to "controlled" or "effortful" processes, occur without intention², without necessarily demanding attention or conscious awareness, and without interfering with other processing (Hasher and Zacks 1979, LaBerge 1984, Posner and Snyder 1975). They are triggered by an event (which may or may not be the subject of conscious awareness), they are difficult to suppress once triggered, they run to completion, and they do not provide the individual with any new information (Schneider and Shiffrin 1977, Shiffrin and Schneider 1977). In the meantime, attention can be focused elsewhere, on controlled

¹Note that most research on automatic processes studies the microprocesses of perception (see LaBerge 1981 for a review), but researchers have adopted the general ideas to understand more complex behaviors and emotions (Greenberg and Safran 1984, Ronis, Yates, and Kirsch 1988).

²Note that the lack of intention refers to process rather than goals. For instance, a skillful right handed tennis player faced with a ball coming to his or her left intends to return the ball (goal) but does not intend to use his or her backhand in a particular way (process); he or she just does it.
processes. Automaticity, then, refers to specific properties of performance: tasks that can be performed quickly, effortlessly, and relatively autonomously are thought to be automatic (Logan 1985).

Some automatic processes are thought to be innate (e.g., encoding the frequencies, spatial locations, and time of events), and do not change much with practice; others (e.g., in reading, knowing that a certain pattern of letters makes a word with a certain meaning) are acquired gradually, over a period of time, through practice (Hasher and Zacks 1979).

Most of the time, automating recurring processes is an effective response to the fact that we face a complex environment equipped with a cognitive system that has severe capacity constraints (Kahneman 1973). However, by their nature, automatic processes lack flexibility, so they cannot easily be adapted to take account of changing circumstances, even when there is a conscious effort to inhibit them. Consequently, making changes to an automated process is difficult, as the next chapter will detail.

Automaticity is not an absolute; it is a relative concept. It is viewed as being on a continuum, although there is some disagreement as to the nature of the continuum. Some researchers conceive of the continuum as having two endpoints, automatic processing and controlled processing (Hasher and Zacks 1979, Shiffrin and Schneider 1977). In other words, the more automated the process is, the less control the individual has over it. Other researchers suggest that automaticity is a continuum with no discrete endpoints, and that automatic and controlled processes are not opposites. Logan (1985) points out that skilled performers (such as experienced pilots) are usually able to control their performance better than unskilled performers (such as novice pilots), even though their performance is likely to be more highly automated, probably because skilled performers are better able to anticipate future responses. Logan's observation is not necessarily inconsistent with the notion that automatic and controlled processes are opposites, at least at the component subskill level. Each subskill involved in a complex skill could become more automated and less controlled as practice
accumulates, while the complex skill itself could remain a controlled process. In other words, there may be processes within processes, and at each level the various processes may be more automated or more controlled, but more automation at one level does not imply more automation at the next higher level of organization.

Since this research defines a habit as a set of automated activities, the idea that there is a continuum between automatic and controlled processes has implications for the way that habits are conceived of in this research.

**Habit-like Behavior**

Definition 3.1 *(habit)*, while clearer and more consistent than many of the definitions preceding it, is still difficult to operationalize if the terms used to describe it, such as "automated," "fixed," and "effortless," are absolutes. It would be difficult to demonstrate that a behavior as complex as the consumption behaviors that are the subject of this research is, in fact, automated, fixed, and effortless. However, since a habit is an automated activity, and automation is a relative concept, then it follows that habits are a relative concept. Furthermore, just as it seems that there is a continuum between automatic and controlled processes, it seems reasonable, by analogy, to posit a continuum between habitual behavior and volitional behavior. To make explicit the distinction between the absolute and relative concepts of habits, the following definition is offered:

**Definition 3.2**

*Habit-like behavior* is behavior that has been sufficiently well-practiced that its execution requires little or no attention.

This definition has both advantages and disadvantages when compared to the more traditional Definition 3.1. The main disadvantage is that it is not clear cut: we cannot say that a particular behavior is or is not a habit; being able to make that distinction would be helpful in empirical research. A clear advantage is that this definition is both intuitively plausible, and consistent with findings from research on concepts and concept formation, which indicate that when people decide
whether or not something (e.g., brushing one's teeth after eating) belongs to a class (e.g., habit) they do not usually appeal to a list of necessary and sufficient conditions that clearly define category membership; instead they take a more "probabilistic" approach. People have in their minds a concept (e.g., habit) that is represented in terms of properties that are only characteristic or probable, rather than defining (Medin and Smith 1984). Thus membership in the "habit" category would be on a continuum, from more habit-like (and less volitional) to less habit-like (and more volitional), where behaviors that are more habit-like possess more characteristic properties than do less habit-like behaviors.

What are these characteristic properties? The definition of habit-like behavior and the previous discussion of automatic processes suggests four properties:

**Property 1:**
Habit-like behavior requires practice to develop.

Since a habit-like behavior is a complex of relatively automatic processes, and automatic processes (with the exception of innate automatic processes, such as those involved in perception) are acquired through practice, a behavior can become habit-like only with practice.

**Property 2:**
Habit-like behavior takes time to develop.

This follows directly from Property 1. Practice takes time. A new, volitional behavior gradually becomes more habit-like as it is repeated over time.

**Property 3:**
A habit-like behavior is initiated by one or more "triggers".

Since habit-like behaviors are a complex of relatively automated processes, and automated processes require activation, it follows that habit-like behaviors also have triggers that activate the component automated activities.

**Property 4:**
Changing habit-like behavior requires effort and attention.
Because habit-like behavior is a relatively automated activity, it is relatively inflexible. Once triggered, the automatic processes tend to run to completion. However, depending on the degree of automation, overriding the automatic process is possible, given sufficient attention and effort (Hasher and Zacks 1979, Shiffrin and Schneider 1977, Logan 1985).

**Does Demarketing Attempt to Change Habit-like Behavior?**

This chapter began by suggesting that discretionary consumption may be more habit-like than volitional, the implication being that behavior change strategies that are appropriate for volitional behavior may be less effective in altering habit-like behavior. A review of the literature on habits and their underlying automatic processes followed. An important issue remains unresolved: whether the types of consumption behaviors that demarketing programs seek to modify can reasonably be characterized as habit-like.

While counterexamples can probably be found, most demarketing programs, though they may use strategies that assume volitional control, do attempt to change behaviors that seem to fit the patterns attributed to habit-like behavior. Consider, for example, programs aimed at curtailing household energy consumption. They urge consumers to turn off unnecessary lights, to lower thermostat settings in the winter and to limit the use of air conditioning in the summer, to run the dishwasher only when it is full, and to wash laundry in cold water. In each of these situations, the pattern of events is consistent with that associated with automatic processes and habits: there is a trigger, such as noticing that ambient light levels are dropping, feeling cooler than is comfortable, realizing that there won’t be enough clean dishes to set the table for the next meal, or knowing that it is washday, which sets off in the individual a stream of behavior which does not demand much attention to perform competently, but which accomplishes superordinate goals such as physical comfort. Furthermore, that stream of behavior is consistent from one performance to the next.
It seems reasonable, therefore, to conclude that much discretionary consumption is, in fact, habit-like. This does not deny that there are instances of discretionary consumption that are relatively volitional. But the volitional behavior change problem is relatively well-understood. Changing behavior that is complex and habit-like is not as well understood. Consequently, this research focuses on reducing habit-like discretionary consumption.

What, then, are the implications of framing the demarketing problem as a habit-change problem? The next section begins to address that question.

**Habit-like Behavior in Marketing and Demarketing**

The preceding discussion of differences between volitional behaviors and habit-like behaviors, as well those between conventional marketing programs and demarketing programs does not imply that habit-like behavior is of concern only in demarketing; it is important in both marketing and demarketing. However, the focus is different. Many marketing programs are aimed at developing habit-like behavior, while many demarketing programs are aimed at changing existing habit-like behaviors. This is a crucial difference.

At the most basic level, marketing is the facilitation of transactions — exchanges in which the customer pays a price (monetary and/or nonmonetary) in order to receive a package of benefits (the product) that is intended to satisfy his or her wants or needs (Houston and Gassenheimer 1987). Much research effort has been devoted to understanding the nature of and processes underlying these transactions. Of the many marketing constructs that have been used to explain various aspects of marketing transactions, two are particularly applicable to this research: habitual purchasing behavior and the related concept of brand loyalty.

Habitual purchasing behavior occurs when a customer has settled on a regular brand, preferably due to brand loyalty, rather than mere inertia. For instance, someone might buy a particular brand of soap regularly, without engaging in extensive search for and evaluation of
information. Such habitual purchasing behavior benefits both the marketer and the consumer, because it eliminates the search and evaluation process, which is expensive for both the organization (which must ensure that the needed information is available at appropriate times and places), and for the customer (who must spend valuable time and energy acquiring and processing the information). Marketing efforts, especially for packaged goods, are often directed towards encouraging habitual purchasing behavior — getting consumers to form the habit of buying a particular brand. Heavy advertising and point of purchase support are used to remind customers of the brand; intensive distribution ensures that the customer will see the brand frequently. The importance of habitual purchasing and brand loyalty is reflected in the attention it receives in university textbooks. Most consumer behavior textbooks include a full chapter (e.g., Assael 1992, Engel and Blackwell 1982) or a major section within a chapter (e.g., Peter and Olson 1993) on the topic.

In most conventional marketing situations, the customer's perception is that most of the costs and benefits associated with a transaction are known, and will accrue in a known time frame, usually the short run: customers think they know what they are getting, and they know how much it costs them. For instance, a bottle of wine has a monetary cost, and may also have some nonmonetary costs, such as the aggravation involved in finding a parking spot in a busy liquor store parking lot. If the wine is consumed with a good meal in pleasant company, the benefits include nourishment of both the body and the soul. Clearly, in cases like this, most of the costs and benefits associated with the transaction are perceived to occur during, just before, or just after consumption of the product. If the consumer enjoyed the bottle of wine, he or she is more likely to buy that brand again. The marketer's goal is to ensure that consumers do enjoy the wine, and that they purchase the brand over and over, each time with a little less information seeking and evaluation of other brands. This represents the development of a habit-like behavior.

In contrast to conventional exchanges like the purchase of a bottle of wine, many demarketing exchanges involve more than developing habit-like behaviors; before a new habit can be developed,
an old habit in the same behavioral domain must be extinguished. That is often difficult, because there may not be many reinforcing benefits associated with breaking old habits. Table 3-1 highlights some of the important differences between conventional marketing and demarketing with respect to habit-like behavior. In contrast to what it takes to develop new habits, breaking old habits often involves convincing consumers:

- to pay what they view as a significant price in the short run (because breaking habits is effortful),
- to continue to pay that price indefinitely (since new habits often take considerable time to become consolidated),
- to pay the price despite uncertain returns (as there are no guarantees that the hoped-for result will actually occur),
- to pay the price even though most of the benefits can only be enjoyed well into the future (because it takes a long time to undo the damage already done),
- to pay the price even when people other than those making the sacrifice will enjoy the benefits (since in many cases demarketing involves public goods).

Table 3-1
Comparison of Conventional Marketing and Demarketing

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Conventional Marketing</th>
<th>Demarketing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketing task</td>
<td>Increase demand</td>
<td>Decrease demand</td>
</tr>
<tr>
<td>Desired consumer behavior</td>
<td>Consume more of something desirable</td>
<td>Consume less of something desirable</td>
</tr>
<tr>
<td>Consumer perception of cost horizon</td>
<td>Short run</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Consumer perception of benefit horizon</td>
<td>Short and/or long run</td>
<td>Long run</td>
</tr>
<tr>
<td>Consumer confidence that personal benefits will exceed costs</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Benefit realized</td>
<td>Personal</td>
<td>Personal or Social</td>
</tr>
</tbody>
</table>
For example, encouraging adults to increase their levels of physical activity (i.e., demarketing sloth) as a preventative health measure means persuading people to change their daily routines by adding a new activity, which many of them will never really enjoy, for the uncertain benefit of better health and longer life, which arguably benefits the health care system as much as it does them. It is not as easy a sell as the relatively clear cut offers in conventional marketing.

Demarketing is therefore often a more ambitious undertaking than is conventional marketing. The demarketer faces a more difficult task on several dimensions. The next chapters examine approaches to changing habit-like behaviors.

**Summary**

This chapter has explored the possibility that demarketing programs are aimed at changing behavior that is more habit-like than volitional. It provided an historical overview of the literature on habits and reviewed critically the definitions and descriptions of habits. In order to integrate various views and to resolve some of the problems with earlier definitions, a new definition was proposed. Since automaticity is a key component of the new definition of habits, the chapter also offered a brief review of research on automatic and controlled processing. That review highlighted the notion that automaticity is relative, not an absolute. It was then argued that, by analogy, habits are also relative. Hence, the concept of habit-like behavior was introduced, defined, and described. The chapter then argued that demarketing does, in fact, deal with habit-like behaviors. The chapter concluded by discussing some of the implications of framing the demarketing problem as a habit-change problem. The following chapters look at changing complex, habit-like behaviors.
CHAPTER 4
A COMPREHENSIVE MODEL OF HABITUAL BEHAVIOR CHANGE

The time has come to break out of past patterns. Attempts to maintain social and ecological stability through old approaches to development and environmental protection will increase instability. Security must be sought through change. (World Commission on Environment and Development 1987, p.22)

Chapter 2 showed that demarketing strategies based on existing marketing theory and methods are, at best, inconsistently successful. It suggested that one reason for such disappointing results might be that traditional marketing approaches are well suited to changing volitional behavior, but excessive discretionary consumption is often more like a habit than a volitional behavior. Chapter 3 explored the implications of this notion. Among other things, it argued that most marketing programs are aimed at developing habit-like behavior (i.e., habitual purchasing behavior and brand loyalty), while most demarketing programs are aimed at changing existing habit-like behaviors. And, as most people know from experience, it is usually easier to develop a new habit than to change an existing habit. This chapter begins to address the next logical question: How can existing habit-like behaviors be changed?

A logical first step in attempting to answer this question is to refer to the existing literature on changing habitual behavior. Reviewing the literature on habits reveals that, while there are plenty of suggestions as to how to change various specific habits, these appear to have developed on an ad
hoc basis, according to the particular characteristics of the specific habit. Each habit-change strategy seems to be driven by its own, habit-specific theory or theories. For instance, strategies to rid people of the nail-biting habit are based on theories of why people bite their nails, while strategies to help people change their eating habits are based on theories of why people develop certain eating habits. Such ad hoc approaches are so habit-specific that they tend not to generalize well.

It should be possible, however, to look across the many studies to determine whether there are basic, common principles underlying the various ad hoc habit change strategies. Only one research team seems to have attempted this. James O. Prochaska and Carlo C. DiClemente and their colleagues (henceforth referred to as "P&D") have, since the early 1980s, been attempting to understand why and how people change, especially with respect to certain kinds of habit-like behaviors.

This chapter outlines the P&D model of behavior change. The model was developed in a psychotherapeutic setting, an area not typically associated with marketing, so the chapter begins with an explanation of why psychotherapeutic theory is an appropriate starting point for understanding better the demarketing problem. It continues with a description of P&D's Revolving Door Model of Behavior Change (e.g., Prochaska and DiClemente 1984) and its variations. It also discusses some of the implications of the model for demarketing.

Why a Psychotherapeutic Model?

Several disciplines study behavior change in humans. Marketing has traditionally drawn on psychology and economics to understand how people behave in their roles as consumers. Psychotherapy, "the treatment of emotional or mental disorders by psychological methods," is a field that has attracted little interest from researchers in marketing. But marketing and psychotherapy are not as far apart as they might initially seem.

---

3According to Webster's II New Riverside Dictionary.
Marketing and psychotherapy share a common foundation discipline, psychology. Like marketing, psychotherapy has a more applied focus than psychology. Both marketing and psychotherapy share the goal of encouraging people to change their behaviors in ways that will make them become happier and more productive members of society. As well, psychotherapy often addresses problems that arise from habitual behaviors — exactly the kind of behavior that is of interest in the case of demarketing.

Since business marketing has, by definition, a commercial focus, its emphasis is on the use of products as the route to happiness. Public and nonprofit marketing has a broader, less commercial perspective, because the primary organizational goal is not profit. Psychotherapy, based on a medical model, assumes that people sometimes need help in changing behavior, and that such help is not solely available through the prefabricated products and services.

It is clear, therefore, that there are important parallels between the demarketing problem and many psychotherapeutic problems. It makes sense that some therapeutic insights would be transferable to the demarketing context, although adaptation to the constraints of the market would no doubt be necessary. What follows is a description of one psychotherapeutic model that may offer a better understanding of the processes necessary to reduce habit-like consumption.

Development of the Model

Within psychotherapy, there are many approaches to accomplishing behavior change. In fact, there are over 200 therapies, each advocating a different set of methods (Prochaska and DiClemente 1984). Each therapy is better suited to some situations than others, so many therapists do not align themselves with a single therapeutic school, but use an eclectic group of therapies, tailored to each treatment situation. In recent years, there have been calls by leaders in the field for integrative models based on commonalities across effective therapies (e.g., Goldfried 1980).
The P&D model of behavior change (e.g., Prochaska and DiClemente 1984, Prochaska, DiClemente, and Norcross 1992) is one response to this need. It is a comprehensive model that describes the behavior change process as a recursive sequence of stages, each with a different pattern of attitudes, behavioral intentions, and behaviors. It deals both with when people change and how they change.

To identify the stages, the methodological approach taken by P&D has been to ask people involved in both self-initiated and professionally-assisted behavior change questions concerning relevant attitudes, behavioral intentions, and behavior. The resulting data has been submitted to both principal component analysis and cluster analysis to yield a series of stages of change. Versions of the stage model have been thoroughly tested in the context of smoking cessation (DiClemente and Prochaska 1982, DiClemente et al. 1991, Pallonen et al. 1990, Prochaska 1985, Prochaska and DiClemente 1983, Prochaska and DiClemente 1984, Prochaska et al. 1988, Velicer et al. 1985) and have also been validated in several other areas: alcoholism, drug abuse, sexual dysfunction, marital problems, and psychic distress (McConnaughy, Prochaska and Velicer 1983, McConnaughy et al. 1989, Prochaska and DiClemente 1982, Prochaska and DiClemente 1984, Prochaska and DiClemente 1986a, Prochaska and DiClemente 1986b). The range of applications in which therapies based on this approach have been successful suggests a robustness that bodes well for its extension to demarketing situations.

Note that, although the P&D model is derived from research on addictions, it would be incorrect to infer that there is an assumption underlying this dissertation research that we are "addicted" to excessive consumption. The use of an addiction-based model merely reiterates that one of the reasons it is difficult to get sustained reductions in discretionary consumption is that there are many habit-like behaviors associated with consumption. Addiction research is relevant here for two reasons. First, an addiction is an extreme form of a habit. Second, addictions comprise a category of habits on which considerable research has been focused. Furthermore, it seems reasonable to
assume that a change strategy that works for an extreme habit (i.e., an addiction) will probably work for a less extreme habit, or a habit-like behavior.

The Linear Version of the Model

In their early research (Prochaska and DiClemente 1982, 1983), P&D identified four sequential stages of change: *precontemplation, contemplation, action*, and *maintenance*, as shown in Figure 4-1. Each stage represents a unique pattern of attitudes, behavioral intentions, and behaviors.

**Figure 4-1**
The Linear Model

<table>
<thead>
<tr>
<th>Precontemplation</th>
<th>Contemplation</th>
<th>Action</th>
<th>Maintenance</th>
</tr>
</thead>
</table>

**Precontemplation.** In the precontemplation stage, people are unaware that they have a problem, and they are not thinking seriously of changing. Their lack of awareness may be due to ignorance, or it may be that they are "in denial." Since moving forward from precontemplation is likely to involve giving up something, as well as risking failure, defensiveness is a natural reaction. It is often manifested in a desire for *others* to change.

**Contemplation.** Contemplation is the stage at which people realize that they should change. They try to understand the problem, its causes, and what they can do about it. They weigh the pros and cons of changing their behavior, keenly aware of the benefits from the behavior that ought to be changed, as well as the effort and energy it will take to make a change. People in the contemplation stage often need to talk about the problem. They may seek reassurance that it can be overcome, often through reading relevant articles and books. Despite their eagerness to talk, contemplators have not made a commitment to change. Many people remain in the contemplation stage for long periods,
thinking of changing their behavior, telling themselves they ought to change their behavior, but never quite feeling ready to do it.

**Action.** In the action stage, people make the commitment of time and energy to change their overt behavior and the environmental conditions that affect their behavior. Their sense of self-efficacy is high. In addition, the changes they make often get the attention of others, so people in the action stage tend to receive social approval, which tends to reinforce the new behavior. Action, however, is only the beginning of change, and people who fail to appreciate that are not likely to prepare themselves properly for the effort it takes to maintain change over the longer term.

**Maintenance.** Maintenance is the stage in which people consolidate their gains, and stabilize the new behavior. This behavioral stability is not an absence of change, but its continuation. People in maintenance are making efforts to avoid slipping back into old patterns of behavior. This stage often lasts a long time. For some people, it never ends.

The goal of the change process is *termination*, a state in which there is no longer any temptation to return to old habits. Some people are never able to truly terminate their problem behavior, even though they may never go back to their old ways, because for some reason, they have to continue to work to maintain their new behavior patterns.

**Deemarketing Insights from the Linear Model**

The linear version of the model offers some useful insights for demarketing. First, it provides another explanation for the common but puzzling finding that many people have positive attitudes toward energy conservation, but they seem not to follow through in their behavior. The P&D linear model would predict that there will be a sizeable segment of the population (people in the contemplation stage of change) with positive attitudes toward energy conservation, but no behavioral manifestation of these attitudes.
A second insight is that, since the patterns of attitudes, behavioral intentions, and behavior differs from stage to stage, demarketing programs must be designed so that they are appropriate for the stage that people are in. For instance, if a person is in the contemplation stage, an action-oriented program, no matter how good it is, is unlikely to be effective, because the contemplator is simply not yet ready to take action.

Indeed, in their research on smokers, P&D have found that professionals typically design excellent action-oriented programs, but the vast majority of people are not in the action stage: aggregating across studies and populations, only 10-15% of smokers are prepared for action, while 30-40% are in the contemplation stage, and 50-60% are in precontemplation (Prochaska, DiClemente and Norcross 1992). Consequently, the programs fail to attract many people and/or have high drop-out rates:

Action-oriented therapies may be quite effective with individuals who are in the preparation or action stages. These same programs may be ineffective or detrimental, however, with individuals in precontemplation or contemplation stages. (Prochaska, DiClemente and Norcross 1992: 1106)

This suggests yet another explanation for the disappointing results of energy conservation programs. It is not outside the realm of possibility that some, perhaps most, energy conservation programs are very effective — for people in a particular stage of change. If there are relatively few people in that stage of change, however, the overall results would be poor.

Readers familiar with the literature on marketing communication may have noticed a similarity between the P&D linear model and the well-known response hierarchy models, such as the AIDA model (Strong 1925), the Hierarchy of Effects model (Lavidge and Steiner 1961), the Innovation-Adoption model (Rogers 1962) and the standard Communications model (e.g., Kotler and Turner 1992). Does the P&D linear model add anything? In one sense, no: the linear version of the model can be viewed as another variation on the same theme. In another sense, it is different because it is intended to the used differently. The response hierarchy models are used primarily in
determining the communication objectives, with the overriding goal of eventually moving the target audience through the stages to purchase. P&D's linear model can also be used in this manner. However, the P&D approach also entails segmenting the market by stage, and the stage of change is the primary segmentation variable. This is a different way of thinking about the market.

Another difference between the response hierarchy models and the P&D linear model is that the latter is merely a simplified version of a more complex model, the Revolving Door Model of Behavior Change.

The Revolving Door Model of Behavior Change

P&D observed that a problem with the linear model is that many people do not progress through the stages sequentially (Prochaska and DiClemente 1984). Some get stuck in a particular stage (usually contemplation). Some give up and return to the precontemplation stage. But the most common pattern is to go into relapse by returning to the problem behavior after an initial slip. In fact, in many types of behavior change, relapse is the rule rather than the exception. However, most people do not give up after relapsing; a significant majority go back into the contemplation stage. This process can happen several times. The average self-changing smoker, for example, relapses three times before becoming relatively free of the temptation to smoke (Prochaska and DiClemente 1984). For people like this, a cyclical pattern would be a more realistic representation of the process of change. The result, a Revolving Door Model of Behavior Change, is shown in Figure 4-2.

Demarketing Insights from the Revolving Door Model

The revolving door metaphor suggests some of the dynamics involved in changing habit-like behavior. First, the use of the term "door" implies that there are two states, analogs to "inside" and "outside." People on the "outside" have problem behavior (such as excessive consumption); people on the "inside" do not (they conserve). The goal for demarketers is to encourage people to move
from precontemplation into the door, through the various stages of change within the door, and then exit, with a new, more conservative approach to consumption.

Second, the "revolving" property of the door can be a problem. If a revolving door is moving too quickly, it can be almost impossible to exit. Likewise, if people try to change too quickly, they may overshoot the maintenance stage and relapse. This pattern, common among, for instance, dieters, is something that demarketers should keep in mind. When an individual reduces his or her consumption rapidly, complying immediately with the goals of a demarketing program, that individual is likely to move quickly into relapse, despite best intentions to the contrary. Habit-like behaviors are, to some extent, automated and inflexible. New, incompatible behavioral patterns need time to become automated, too.
Third, if enough momentum is not generated, a revolving door can stall, just as people can st all in a particular stage. It is not uncommon, for example, for people to stay in the contemplation stage indefinitely, thinking that they really ought to do something about their behavior, but never getting around to doing it. This reinforces the notion that demarketing programs are important, but they need to be correctly targeted.

Fourth, being "in the door" is only a means to an end. People in the maintenance stage, although on the right side of the behavioral wall, are still within the revolving door. Within the door, (i.e., during the behavior change process) the new behavior requires conscious attention for consistent performance. The ultimate goal of demarketing programs is to help people reduce their discretionary consumption automatically, without reminders or the requirement for conscious attention.

Fifth, one of the most important insights from the Revolving Door Model is that failure is normal, and should be expected. In fact, it may be that failure is essential for success, because there may some things that can be learned only through failure. This implies that demarketing programs should include components designed to give people who have reverted to excessive consumption patterns incentives and strategies to try once again to reduce their consumption.

A Spiral Model of the Stages of Change

A further refinement of the P&D model (Prochaska, DiClemente and Norcross 1992) adds a third dimension. In this version of the model, shown in Figure 4-3, the stages of change are shown in a spiral pattern. The spiral illustrates explicitly the finding that people who relapse do not, as the Revolving Door Model might imply, revolve endlessly in circles, regressing with each failure all the way back to where they started; instead, they can learn from their mistakes, and try different strategies the next time around (DiClemente, et al. 1991).

The spiral model also includes, based on a re-analysis of the data that led to the development of the revolving door model, an additional stage of change between contemplation and action. People
in the preparation stage are making small behavioral changes (such as reducing the number of cigarettes they smoke in a day, or delaying their first cigarette of the day), and intend to make the big change (abstinence from smoking or alcohol) very soon. In demarketing research, the preparation stage might be difficult to identify, as the behavioral goal is reduction, rather than abstinence.

The spiral model does offer a more complete representation of the process of behavior change than the revolving door model does, but, because of the exploratory nature of this dissertation research, the simpler revolving door model will be the primary focus.

Ten Change Processes

The Revolving Door Model seems to describe well the process of behavior change where there is a significant short term cost for an uncertain return that certainly will not be received until some time in the future, if at all (see Prochaska and DiClemente 1984 for a summary of empirical tests of the model before 1984, and McConnaughy et al. 1989 for a more recent but less comprehensive review). The model’s utility is further enhanced by the investigation of how people
progress from one stage of change to the next. P&D have investigated the processes of change:
"covert and overt activities and experiences that individuals engage in when they attempt to modify problem behaviors," (Prochaska, DiClemente and Norcross 1992: 1107), and the integration of the stages and processes of change.

Based on principal components analysis, followed up by extensive validity and reliability checks, P&D have distilled almost 400 different psychological therapies based on divergent theoretical assumptions (hence the "transtheoretical" label), and over 130 different self-change techniques, down to ten processes (DiClemente and Prochaska 1982, Prochaska and DiClemente 1983, Prochaska and DiClemente 1984, Prochaska, DiClemente, and Norcross 1992). The ten processes of change are listed in Table 4-1 and explained below. Note that the terminology is based in psychotherapy, but in most cases the concepts have marketing analogs.

Table 4-1
Processes of Change

| 1. | Consciousness raising |
| 2. | Self-reevaluation |
| 3. | Social (or environmental) reevaluation |
| 4. | Self-liberation |
| 5. | Social liberation |
| 6. | Counter-conditioning |
| 7. | Stimulus control |
| 8. | Contingency (or reinforcement) management |
| 9. | Dramatic relief |
| 10. | Helping relationships |

Consciousness Raising. Consciousness raising increases the information available to individuals so they can make more effective responses to the stimuli they encounter. Consciousness raising can take two forms. Feedback is information given a person about the effects of his or her own actions and experiences. Education is information contained in stimuli generated by the environment (DiClemente and Prochaska 1982, Prochaska and DiClemente 1983, Prochaska and DiClemente 1984). Specifically, consciousness raising involves increasing information about oneself
and the problem, through observations, confrontations, interpretations, and bibliotherapy (Prochaska, DiClemente and Norcross 1992). For example, utility bills provide customers with feedback on their resource use (although so delayed that its usefulness is doubtful), and advertisements about compact fluorescent bulbs can be classified as education.

Self-Reevaluation. Self-reevaluation is a realistic appraisal of the pros and cons of trying to overcome a problem by changing behavior. It requires the person to recognize that his or her values are in conflict, and that a change in behavior will cost something of value (DiClemente and Prochaska 1982, Prochaska and DiClemente 1983, Prochaska and DiClemente 1984). Specifically, self-reevaluation involves assessing how one feels and thinks about oneself with respect to a problem through value clarification, imagery, and corrective emotional experience (Prochaska, DiClemente and Norcross 1992). For instance, some people who are considering making a serious effort to conserve energy must trade off their expectations about normal levels of ambient light and their desire to behave environmentally responsibly (assuming that is, indeed, what motivates them).

Social (or Environmental) Reevaluation. Social (or environmental) reevaluation requires an appreciation of the impact a change in behavior would have on other groups and/or the physical environment. This may be achieved through empathy training and documentaries (DiClemente and Prochaska 1982, Prochaska and DiClemente 1983, Prochaska and DiClemente 1984, Prochaska, DiClemente and Norcross 1992). For instance, New York State's decision not to buy power generated by the James Bay II hydroelectric project in Northern Quebec was at least partly the result of widespread social reevaluation, due to a lobbying and public relations efforts of the environmental movement and the Cree living in the area that would have been flooded by the new project.

Self-Liberation. Self-liberation involves becoming aware of new alternatives, as well as increasing the sense of self-efficacy with respect to making a particular option succeed. The latter is achieved partly by recognizing that merely making a commitment to a particular alternative makes it more likely to work. At the same time, there must be an appreciation of constraints that cannot
be removed (DiClemente and Prochaska 1982, Prochaska and DiClemente 1983, Prochaska and DiClemente 1984). Specifically, self-liberation involves choosing to act or believing in one's ability to change, which may be accomplished through decision-making therapy, New Year's resolutions, logotherapy techniques, and commitment enhancing techniques (Prochaska, DiClemente and Norcross 1992). An example of self-liberation in an energy conservation context might be a high school student who begins to realize that she can influence the behavior of other family members just by consistently pointing out opportunities for and practicing energy conservation. Thinking that she could singlehandedly prevent or postpone the building of new hydroelectric dams would, however, be unrealistic.

Social Liberation. Social liberation involves changes in the environment that lead to a wider array of choices for certain groups of people. Some people may benefit by becoming involved in groups which lobby for more alternatives (DiClemente and Prochaska 1982, Prochaska and DiClemente 1983, Prochaska and DiClemente 1984). Specifically, social liberation involves increasing alternatives for nonproblem behaviors available in society, through advocating for rights of repressed groups, empowering others, and policy interventions (Prochaska, DiClemente and Norcross 1992). Thus, some people may want to become involved in consumer groups that pressure manufacturers to produce and promote energy-efficient appliances.

Counter-Conditioning. Counter-conditioning changes the way people experience or respond to particular stimuli. It involves learning new responses to conditional stimuli, so that gradually these new responses replace the problem responses (DiClemente and Prochaska 1982, Prochaska and DiClemente 1983, Prochaska and DiClemente 1984). Specifically, counter-conditioning involves substituting alternatives for problem behaviors through relaxation, desensitization, assertion, and positive self-statements (Prochaska, DiClemente and Norcross 1992). Not so many years ago, for example, an office building with lights on all night was either ignored, or thought of as an attractive addition to a skyline; now, many people are appalled at the unnecessary waste inherent in such
practices, and make negative judgements about the social responsibility of firms that engage in this behavior. This is the result of counter-conditioning.

**Stimulus Control.** With stimulus control, a person restructures his or her environment (or it is restructured by someone else) so that the probability of a particular conditional stimulus occurring is significantly reduced (DiClemente and Prochaska 1982, Prochaska and DiClemente 1983, Prochaska and DiClemente 1984). Specifically, stimulus control involves avoiding or countering stimuli that elicit problem behaviors by restructuring one’s environment (by, for instance, removing alcohol or fattening foods), avoiding high risk cues, and the use of fading techniques (Prochaska, DiClemente and Norcross 1992). Wearing warmer clothes at home in the colder months of the year is an example of stimulus control. By dressing more sensibly, people are less likely to feel chilly, and are therefore less tempted to turn up the heat.

**Contingency (or Reinforcement) Management.** The behaviorist school of psychology holds that behavior is under the control of its consequences: if a desired reinforcement is made contingent on a particular response, then the probability of making that response is increased. On the other hand, if particular punishments are made contingent on certain responses, those responses are less likely to be made. The extent to which a given consequence controls behavior depends on its immediacy, saliency, and schedule (DiClemente and Prochaska 1982, Prochaska and DiClemente 1983, Prochaska and DiClemente 1984). Specifically, contingency management involves rewarding one’s self or being rewarded by others for making changes through contingency contracts, overt and covert reinforcement, and self-reward (Prochaska, DiClemente and Norcross 1992). The pricing of electricity can be thought of as contingency management. The actual price, as well as rebates for conservation, and frequency and detail of billing all contribute to reinforcing or punishing certain types of electricity consumption behavior.

**Dramatic Relief.** As far back as Aristotle, it has been known that the reactions from observing emotional scenes can move people to change (DiClemente and Prochaska 1982, Prochaska
and DiClemente 1983, Prochaska and DiClemente 1984). Specifically, dramatic relief involves experiencing and expressing feelings about one's problems and solutions through psychodrama, grieving losses, and role playing (Prochaska, DiClemente and Norcross 1992). For instance, Hydro Quebec faced serious popular opposition to its James Bay II project, at least partly due to people's emotional reaction to the effect that James Bay I had on native people in the area.

Helping Relationships. Helping relationships are both a precondition and a process of change. A helping relationship is characterized by openness, trust, warmth, and understanding. Help can be in the form of technical expertise, or more emotional support (DiClemente and Prochaska 1982, Prochaska and DiClemente 1983, Prochaska and DiClemente 1984). Specifically, helping relationships involve being open and trusting about problems with someone who cares, in a therapeutic alliance, social support, or self-help group (Prochaska, DiClemente and Norcross 1992). In the case of energy conservation, an electric utility might be seen by many of its customers as a helpful partner in their efforts to change, mostly through the provision of information.

While these ten processes of change are not a complete compendium of the ways that people can and do change, they are useful as a starting point for discussion and research. P&D next examined how the processes of change are used at different stages of change.

Integration of Stages and Processes of Change

One of the interesting and practical findings from the work of P&D is that all ten processes of change are used to a certain extent in all the stages of change, but different processes seem to be more commonly used at each stage. This is important, because it defines which processes have a better chance of helping people progress from one stage to the next. Figure 4-4 (Prochaska and Di Clemente 1984) shows the integration of stages and processes.

Confirmatory analysis has supported the ten-process model, but also identifies two secondary factors, labeled *experiential* and *behavioral* (Prochaska, Velicer, DiClemente, and Fava 1988). The
experiential processes involve cognitive and/or affective activities. The behavioral processes involve, as the label implies, behavioral activities.

Both cross-sectional and longitudinal studies have shown that, while there are differences in the absolute frequency of the use of change processes across problems, certain processes are consistently more useful at certain stages (Prochaska, Velicer, DiClemente, and Fava 1988). Precontemplators, as would be expected, tend not to use any of the change processes, because they see no reason to change. People in contemplation are most open to experiential strategies: consciousness raising, dramatic relief, and environmental reevaluation. As people prepare for action, they continue to use those processes, and add behavioral processes: counterconditioning and stimulus control. During the action stage, people tend to use behavioral strategies: self-liberation (willpower),
counterconditioning, and stimulus control, as well as helping relationships. People in maintenance build on the mix of experiential and behavioral processes that came before, especially self-reevaluation, counterconditioning, and stimulus control. As well, they engage in reinforcement management (Prochaska, DiClemente, and Norcross 1993; Prochaska, Velicer, DiClemente, and Fava 1988).

There are two important omissions in this analysis: the processes of change that move people from precontemplation to contemplation, and those that move people from maintenance to termination. In other words, the instigators of movement into and out of the revolving door are not included.

The former issue, what moves people out of precontemplation, has been studied (Prochaska and DiClemente 1984). People in the precontemplation stage are not particularly concerned or involved with the problem, so they do not process much information about it, nor do they spend much energy reevaluating themselves, or experiencing emotions about the problem, or anything else, for that matter. Prochaska and DiClemente (1984) speculate, based on their experience and on theory, that movement is most likely due to either developmental changes or environmental changes. Developmental changes are those that occur due to aging. For example, the peak age for people to decide to quit smoking is 39. It is probably no coincidence that at about age 40, many people begin to think seriously about their mortality, and make some changes in their lives. Environmental changes refer to alterations in an individual's external environment, such as new ordinances restricting smoking to certain defined areas.

The second issue, concerning what moves people from maintenance to termination, is even less well understood. What is known is that it takes time, presumably for the new behavior patterns to become habits and for the old, problem behavior patterns to be extinguished. It is unclear whether there are things that can be done to minimize the chances of relapse, but a healthy sense of self-
efficacy would seem to be important, so that the inevitable slips are not interpreted as irredeemable signs of failure.

Summary

In summary, the P&D Revolving Door Model of Behavior Change suggests that people go through several discrete stages of change as they alter their habits. They may cycle through the stages several times before the new behavior becomes well-entrenched in their lives. Various processes of change can be used to encourage movement from stage to stage, with certain processes being more effective at some stages than others.

This approach seems well suited to demarketing problems of the sort that is the subject of this dissertation research. The Revolving Door Model of Behavior Change describes and explains how people change habitual and habit-like behaviors, where the change entails significant short run costs for uncertain returns that they have to have faith will be positive. The stages of change aspect focuses on explaining when people make particular kinds of changes in modifying their behavior, and the processes of change aspect addresses the issue of how people move from one stage to another.

The next logical step is to test empirically whether the model generalizes to a typical demarketing situation. The next chapter describes the design of one such test.
Chapter 4 outlined three versions of the P&D model of behavior change and suggested that the model may offer a new and useful perspective on demarketing problems. Conceptually, the Revolving Door version of the model seems to apply well to demarketing. A logical next step is to test empirically whether the model generalizes to a typical demarketing situation.

This chapter presents hypotheses and describes the design of a study intended to explore the degree to which the Revolving Door Model of Behavior Change provides a reasonable and useful description of behavior change in a demarketing context.

General Approach

Testing the Revolving Door Model of Behavior Change in a demarketing context took place in two steps. It was first necessary to test whether people in the target market for a given demarketing program could be successfully classified into one of the six stages of change (precontemplation, contemplation, action, maintenance, relapse, and termination). Once successful classification could be demonstrated, it was then possible to test whether key results from past studies of the Revolving Door Model, particularly results concerning variables that differentiate among the stages of change, could be obtained in the context of that demarketing situation.
The classification step was accomplished by adapting the Short Form Stages of Change Questionnaire for Smoking (Prochaska undated) to a particular demarketing situation. The test of whether key results could be obtained in a demarketing context was accomplished by adapting a study relating the stages of change to a decisional balance measure (Velicer et al. 1985) to the demarketing situation.

The Original Decisional Balance Study

According to Decisional Balance Theory (Janis and Mann 1977), people make decisions based on their evaluations of the gains and losses associated with the alternatives. However, it is not the absolute amount of the gains and losses that determine whether an alternative will be chosen; rather, it is the amount of the gains and losses compared to what the person already has, or knows that others have, that determines the choice.

Velicer, et al. (1985) describe the development of a 24-item Decisional Balance measure to assess and predict the smoking status of 960 current and former smokers. The assumption driving the research was that the decision to quit smoking is the result of comparisons of gains and losses. Two independent scales, the Pros of Smoking and the Cons of Smoking, were identified, and were successful in differentiating among five groups representing stages of change in the quitting process. In other words, people at different stages of the quitting process assessed the relative importance of the pros and cons of smoking differently. For instance, people in the "immotive" (precontemplation) stage viewed the pros of smoking as outweighing the cons; while people in the contemplation stage viewed the pros and cons as being nearly in balance.

---

4 Velicer at al. (1985) used five groups, named differently but corresponding to the Revolving Door stages of change: immotives (precontemplation), contemplator (contemplation), recent quitters (action), long term quitters (maintenance), and relapsers (relapse). The termination stage was not mentioned in the study.
Study 1 attempted to adapt the Velicer, et al. (1985) approach to differentiating among the stages of change based on a decisional balance framework to a demarketing context. The rationale for the study was that, if similar results could be obtained, then confidence in the applicability of the Revolving Door Model of Behavior Change in demarketing situations would increase.

Hypotheses

The hypotheses are stated here in general terms; operational versions of the hypotheses are presented after the study has been described in more detail.

Velicer et al. (1985) found that, in the "immotive" (precontemplation) stage, people rated the pros of smoking as more important than the cons of smoking. In other words, consistent with the Revolving Door Model of Behavior Change, as far as people in this stage were concerned, the importance of the advantages of smoking (i.e., the "old" behavior) exceeded the importance of the disadvantages by such a margin that they really had no reason to consider quitting. In a demarketing context, a similar finding is be expected:

Hypothesis 1
For people in the precontemplation stage, the importance of disadvantages associated with the new behavior will exceed the importance of the advantages.

Velicer et al. (1985) also found that, in the contemplation stage, people rated the importance of the pros and cons of smoking about equally, although the cons of smoking were slightly more important. The pros of smoking were still very important to them, but the cons were much more important than they were for people in the immotive (precontemplation) stage. In other words, for people in the contemplation stage, the importance of the advantages of smoking was about the same as the importance of the disadvantages.

\[\text{Velicer\ et\ al.\ (1985)\ refer\ to\ pros\ and\ cons\ of\ smoking;\ Janis\ and\ Mann\ (1977)\ refer\ to\ gains\ and\ losses;}\ \text{in\ this\ dissertation\ research\ the\ elements\ of\ the\ comparison\ will\ be\ termed\ advantages\ and}\ dis advantages,\ \text{where\ the\ advantages\ and\ disadvantages\ refer\ to\ the\ new\ behavior.\ For\ instance,\ if}\\ \text{a\ demarketing\ program\ were\ trying\ to\ get\ people\ to\ use\ less\ gasoline,\ an\ advantage\ of\ using\ less}\ \text{gasoline\ might\ be\ saving\ money,\ and\ a\ disadvantage\ might\ be\ inconvenience.}\]
as the importance of the disadvantages. The large increase in the importance of the cons of smoking caused people in contemplation to seriously consider quitting. This pattern is consistent with the description of the contemplation stage of the Revolving Door Model of Behavior Change. In a demarketing context, similar findings are expected:

**Hypothesis 2a**
For people in the contemplation stage, the importance of disadvantages associated with the new behavior will equal the importance of the advantages associated with it.

**Hypothesis 2b**
People in the contemplation stage will view the advantages associated with the new behavior as being more important than will people in the precontemplation stage.

**Hypothesis 2c**
People in the contemplation stage will view the disadvantages associated with the new behavior as being no more or less important than will people in the precontemplation stage.

Concerning "recent quitters" (people in the action stage), Velicer et al. (1985) found that the importance of the cons of smoking clearly exceeded the importance of the pros of smoking. Consistent with the Revolving Door Model of Behavior Change, people seemed to be motivated to take action when, as far as they were concerned, the disadvantages of smoking clearly outweighed the advantages. Interestingly, the importance of both the pros and cons of smoking were less for people in the action stage than they were for people in the contemplation stage. It seems that actually taking action makes the issue of changing one's behavior less attention-getting than does thinking that one ought to take action. This, too, is consistent with descriptions of the dynamics of the contemplation and action stages of change in the Revolving Door Model of Behavior Change. In a demarketing context, similar findings are expected:

**Hypothesis 3a**
For people in the action stage, the importance of the disadvantages associated with the new behavior will be exceeded by the importance of the advantages associated with it.
Hypothesis 3b
People in the action stage will view the advantages associated with the new behavior as being less important than will people in the contemplation stage.

Hypothesis 3c
People in the action stage will view the disadvantages associated with the new behavior as being less important than will people in the contemplation stage.

Velicer et al. (1985) found that long-term quitters (people in the maintenance and termination stages), like recent quitters (people in the action stage), rated the importance of the cons of smoking as exceeding the pros of smoking. Both pros and cons of smoking were less important to people in the maintenance stage than to people in the action stage. The latter result may be due to the fact that, the longer people have managed to keep from smoking, the less important the whole issue of smoking would be to them. These findings are consistent with the descriptions in the Revolving Door Model of Behavior Change. In a demarketing context, the following findings concerning the maintenance stage are expected:

Hypothesis 4a
For people in the maintenance stage, the importance of the disadvantages associated with the new behavior will be exceeded by the importance of the advantages associated with it.

Hypothesis 4b
People in the maintenance stage will view the advantages associated with the new behavior as being less important than will people in the action stage.

Hypothesis 4c
People in the maintenance stage will view the disadvantages associated with the new behavior as being less important than will people in the action stage.

Velicer et al. (1985) found that people in the relapse stage viewed the pros of smoking as being slightly more important than the cons of smoking, which might explain why they returned to smoking after having stopped. But for relapsers, the pros and cons of smoking were in balance, and both were very important, much more important than they had been in the maintenance stage, reflecting a new preoccupation with smoking and/or quitting. Such a preoccupation would be natural
in people who had successfully overcome the urge to smoke for some time, only to succumb once again. Again, these findings are consistent with descriptions of the relapse stage of the Revolving Door Model of Behavior Change. In a demarketing context, similar findings are expected:

**Hypothesis 5a**
For people in the relapse stage, the importance of disadvantages associated with the new behavior will equal the importance of advantages associated with it.

**Hypothesis 5b**
People in the relapse stage will view the advantages associated with the new behavior as being more important than will people in the maintenance stage and people in the action stage.

**Hypothesis 5c**
People in the relapse stage will view the disadvantages associated with the new behavior as being more important than will people in the maintenance stage or people in the action stage.

Velicer et al. (1985) did not explicitly study people in the termination stage, although their "long term quitters" category may have included people in both the maintenance and termination stages of change. However, the Revolving Door Model of Behavior Change suggests that people in the termination stage would view the disadvantages of smoking as being more important than the advantages, but since smoking is no longer a concern for people in termination, the importance of both would be low. In a demarketing context, this would suggest the following hypotheses:

**Hypothesis 6a**
For people in the termination stage, the importance of disadvantages associated with the new behavior will be exceeded by the importance of advantages associated with it.

**Hypothesis 6b**
People in the termination stage will view the advantages associated with the new behavior as being less important than will people in the maintenance stage.

**Hypothesis 6c**
People in the termination stage will view the disadvantages associated with the new behavior as being less important than will people in the maintenance stage.
Note that other hypotheses are also possible. For instance, the relationship between the importance of the Advantages to people in the contemplation stage and the maintenance stage could be hypothesized by extension of Hypotheses 3b (relating the importance of the Advantages in the action and contemplation stages) and Hypothesis 4b (relating the importance of the Advantages in the maintenance and action stages). However, it is the relationships within a particular stage (the "a" version of each hypothesis) and between adjacent stages (the "b" and "c" versions of each hypothesis) that are most important from a conceptual point of view. Consequently, extensional hypotheses are not included.

Methodological Approach

The data for this study were collected in a telephone survey. The use of a survey was consistent with the methodology employed by Velicer et al. (1985). A telephone survey was chosen over mail or face-to-face interviews for two reasons. First, the questionnaire developed for this study was easily administered by telephone. It required no visual aids and questions were structured so that respondents did not have to recall a large number of alternative responses. Second, it was cost-efficient, particularly since there was an opportunity to "piggyback" on another telephone survey. (See Barnes 1991 for a discussion of the factors that should be taken into account in choosing a data collection method).

The use of a telephone survey had a potential disadvantage, though; it required self-reports of behavior, and self-reports are sometimes unreliable. This potential problem was one of the considerations that influenced the choice of the specific behavior change situation studied — cold water laundry washing.
Criteria for the Target Behavior

The specific behavior change situation studied, cold water laundry washing, was chosen to satisfy three key criteria. First, the behavior had to have been the object of a demarketing program. Second, past demarketing had to have focused on changes in usage behavior, rather than changes in purchasing behavior. Third, accurate self-reports concerning the behavior had to be relatively easy to make. The rationale for each criterion is discussed below.

Object of a Previous Demarketing Program. In order to test the hypotheses, it was essential that there be people in each of the stages of change. If people had never been asked to change their behavior, virtually everyone surveyed would be in the precontemplation stage, and there would be no opportunity to test hypotheses having to do with stages other than precontemplation. Consequently, the behavior chosen had to have been the object of a demarketing program.

Since energy conservation programs, in which energy in its various forms is demarked, have been widespread since the early 1970s, it was decided to focus on energy conservation behaviors.

Focus on Changes in Usage Behavior. Like many consumption reduction behaviors, energy conservation involves many separate behaviors — buying energy-efficient appliances, using the car less, turning out unnecessary lights, running the dishwasher only when it is full, deciding not to buy that hot tub, turning down the heat when no one is home, and so on. Clearly there is a large number of behaviors that could accurately be called energy conservation. However, the focus of this dissertation research is restricted to a subset of energy-related behaviors, those involving habits or habit-like behaviors. To clarify the distinction, Definition 5.1 was developed.

Definition 5.1
Energy conservation is behavior deliberately aimed at reducing discretionary consumption of energy, through changes in purchasing behavior and/or through changes in usage behavior.
**Definition 5.1.1**

*Changes in purchasing behavior* that constitute energy conservation include: (1) the substitution of energy-efficient products, brands, or models for less energy-efficient alternatives (e.g., compact fluorescent light bulbs for incandescent light bulbs, more energy-efficient appliances for less energy-efficient appliances, lined or foam-backed draperies for unlined curtains or blinds, adding insulation to the attic); and (2) the decision not to purchase or replace luxury products (i.e., those not commonly regarded as necessities) that use relatively large amounts of electricity (e.g., hot tubs, home computers, VCRs, color televisions).

**Definition 5.1.2**

*Changes in usage behavior* that constitute energy conservation include substitutions of energy-conserving habits or habit-like behaviors for less energy-conserving habits or habit-like behaviors (e.g., setting the thermostat lower at night and when no one is home, setting a lower temperature on the water heater, turning off lights when no one is in the room, washing only full loads of laundry, using cold water).

Changes in purchasing behavior and changes in usage behavior are both important means of reducing discretionary consumption of energy, but this dissertation research addresses only the latter. Consequently, the behavior chosen for this study was an energy conservation behavior that involved changes in usage behavior.

**Accuracy in Self-Reports.** Even if people are asked questions about changes in usage behavior that constitute energy conservation (as defined in Definition 5.1.2), they have to consider several behaviors. This puts demands on memory that may compromise accuracy. To improve accuracy, a common research strategy is to ask about specific behaviors. Even here, though, there are potential problems.

Many conservation behaviors, like turning out unnecessary lights, are not particularly attention-getting, so people are often unable to estimate accurately the frequency with which they engage in the behavior in question. As well, subjectivity is inherent in many of the measures used to identify energy conserving behaviors. What does "unnecessary lights" mean? How full is a "full dishwasher"? In addition, people may bias their responses toward what they think they should be
thinking or doing. The result of these problems is the potential for a great deal of "noise" in the data.

Consequently, the behavior chosen for this study was an energy conservation behavior that involved changes in usage behavior. In addition, the behavior had to be attention-getting enough and sufficiently well-defined to encourage accurate reports by respondents.

**Behavioral Context: Cold Water Washing**

The behavior change situation chosen for study was the switch from hot and warm water washing to cold water washing. It meets all three criteria discussed in the previous section. People have been encouraged for several years to save energy by switching from using hot or warm water for laundry to using cold water. Cold water washing is a single, well-defined usage behavior that conserves energy. It was judged that laundry behavior is both sufficiently routine and sufficiently attention-getting to enable people to make relatively accurate reports. Subjectivity is reduced, too, since the water temperature choices on most washing machines are clear — cold, warm, or hot.

Cold water washing had an additional advantage, too. Industry research indicated that cold water washing may be a proxy for other electricity conservation behaviors (Burr 1991). In other words, according to the industry research, people who do their laundry in cold water are more likely than people who do their laundry in warm or hot water to engage in a variety of other conservation behaviors, such as turning off unnecessary lights, using less heat in winter and less air conditioning in the summer, keeping the water heater at a lower temperature, and taking advantage of energy saving products, such as fluorescent light bulbs. To the extent that cold water washing is a proxy for other conservation behaviors, results from this study can be generalized to other energy conservation behaviors.

The cooperation of BC Hydro, British Columbia's electric utility, was obtained for this study. BC Hydro had, for several years, been encouraging electricity conservation among its residential,
commercial and industrial users. Programs had been based on attitude-behavior models of behavior change and, despite significant investments of time and money (e.g., a large investment in the Power Smart mass media advertising campaign supported by a regular mail-out program, rebates on energy efficient appliances such as hot water heaters and refrigerators, and extensive related research), results had been disappointing. Per capita consumption of electricity was not decreasing (Burr 1991).

Sample

The survey was conducted by MarkTrend Research, Inc., a Vancouver-based market research firm. Randomly selected adult residents of each of BC Hydro's four service districts (Vancouver Island, Lower Mainland, South Interior, and North Interior) were contacted by telephone in their own homes and asked to participate in a survey among residents of British Columbia about utility companies. Telephone numbers were randomly selected from local directories, in proportion to the population in each district. To cover new and unlisted numbers, "10" was added to each number selected. Within sampled homes, either the male or female head of household was interviewed, in rotation. Up to three callbacks were made to minimize nonresponse bias, and supervisors checked back with more than 10% of the respondents to ensure that interviews had taken place. MarkTrend Research, Inc. did not provide figures on the number and types of survey (as opposed to question) nonresponse.

A total of 666 randomly selected adult residents of British Columbia responded to the survey. In order to maximize accuracy of responses, only respondents who possessed all of the following characteristics qualified for inclusion in this study:

- primary responsibility for doing the household laundry;
- knowledge of the number of loads done in a typical week;
- knowledge of the number of loads done with both cold water wash and cold water rinse in a typical week;
• access to a washing machine in the home, rather than in a shared laundry room or
laundromat*; and
• access to a washing machine that permitted cold water wash and cold water rinse.

Of the 666 survey respondents, 340 possessed all the qualifications. The sample size for this study
was therefore 340.

Procedure

The instrument for this study was embedded in the *Power Smart Tracking Study: Wave 7.*
After the request to participate, all respondents first answered a series of questions about advertising
by B.C. utilities, advertising by BC Hydro, participation in BC Hydro rebate programs, and attention
to the amount of electricity they used. The questions for this study followed. They began with a
qualifier item. Then, qualifying respondents answered questions about present and past laundry
practices with respect to cold water washing and rinsing, as well as intentions for the future (the
stages of change items); as well as the importance of various factors in the water temperature decision
(the decisional balance items).

All respondents then answered questions on bill payment plans, lifestyle changes due to
environmental concerns, home and hot water heating, and compact fluorescent light bulbs.
Demographic questions ended the survey.

The time taken to complete the survey varied considerably, because parts of the questionnaire
were answered only by qualified respondents. Most respondents who qualified for the questions used
in this study took between 15 and 20 minutes to complete the whole survey.

---

*This criterion was included because in laundromats and shared laundry rooms, the cost for a load
of laundry is usually the same, no matter what water temperature is used. In contrast, people with
laundry facilities in their own homes pay directly for the cost of heating water, so there is a cost
advantage to using cold water rather than hot or warm water. Since the cost advantage of cold water
washing was alluded to directly or indirectly in some of the decisional balance items, people without
in-home laundry facilities were not included in the survey.
Questionnaire

A copy of the full Power Smart Tracking Study: Wave 7 questionnaire appears in Appendix 1. Items 39 to 66 were developed specifically to test Hypotheses 1 to 6c. Those 27 items can be divided into three groups: qualifiers, stage of change items, and decisional balance items.

Qualifiers. The first group of items (Q.39 to Q.41) qualify respondents to answer the stages of change and decisional balance items. As noted above, only respondents who possessed all of the following characteristics were asked to respond to the stages of change and decisional balance items: primary responsibility for doing the household laundry; knowledge of the number of loads done in a typical week; knowledge of the number of loads done with both cold water wash and cold water rinse in a typical week; access to a washing machine in the home, rather than in a shared laundry room or laundromat; and access to a washing machine that permitted cold water wash and cold water rinse.

Stages of Change Items. Qualifying respondents were then asked a set of questions (Q.42 to Q.47) concerning their own laundry behavior and behavioral intentions. These items were modelled after items used to classify people in the process of quitting smoking (Prochaska undated). Operational definitions of the six stages of change are presented below.

**Definition 5.2**
*Precontemplation* is operationally defined as: no regular use of cold water wash and cold water rinse presently or six months ago, and no intention to use cold water wash and cold water rinse six months in the future.

**Definition 5.3**
*Contemplation* is operationally defined as: no regular use of cold water wash and cold water rinse presently or six months ago, but expectation of regular use six months in the future.

**Definition 5.4**
*Action* is operationally defined as: some regular use of cold water wash and cold water rinse at present, representing an increase over six months ago.
**Definition 5.5**

*Maintenance* is operationally defined as: some regular use of cold water wash and cold water rinse, at the same level as six months ago.

**Definition 5.6**

*Relapse* is operationally defined as: a reduction in the use of cold water wash and cold water rinse over the last six months.

**Definition 5.7**

*Termination* is operationally defined as: all loads for the past six months regularly done in cold water wash and cold water rinse.

An *unclassified* category was also included to accommodate individuals who could not remember what their laundry behavior was six months ago, or who did not want to speculate on what they would be doing six months in the future.

**Decisional Balance Items.** After the laundry behavior questions, qualifying respondents were asked a set of attitudinal items (Q.48 to Q.66) based on the decisional balance theory of decision making (Janis and Mann 1977), and adapted from those in the instrument developed by Prochaska and DiClemente and their colleagues for a 1985 study of smokers (Velicer, et al. 1985). In that research, a 24-item Decisional Balance measure was developed to assess and predict smoking status. The assumption driving the research was that decision making is the result of comparisons of gains and losses. Two independent scales, the *Pros of Smoking* and the *Cons of Smoking*, were identified, and were successful in differentiating among five groups representing stages of change in the quitting process.

For this study, items were written to represent the advantages and disadvantages associated with cold water washing and rinsing of laundry. A small convenience sample (*n* = 8) of people who regularly do laundry provided suggestions for additional items representing negative or positive aspects of cold water washing and rinsing. Further pretests with a convenience sample of volunteers (*n* = 16) identified items that were obscure, unclear, irrelevant, or inaccurate. These were revised or dropped. The initial item pool was thereby reduced to 20 items, one of which was inadvertently dropped due to an administrative error. The final pool was therefore 19 items, each of which
described either an advantage or a disadvantage of cold water washing. A final pretest, again with a convenience sample of volunteers, confirmed that the advantages items and the disadvantages items represented equally strong arguments in favor of and against cold water washing.

The ten advantage items used in the telephone survey were:

- Washing in cold water saves energy.
- Cold water is less harmful to fabrics.
- Washing in cold water keeps colors bright.
- Washing in cold water prevents clothes from shrinking.
- Washing in cold water saves money.
- Washing in cold water helps protect the environment.
- Detergents made especially for cold water use work as well as other detergents work in hot water.
- Cold water prevents colors from running.
- For all but really tough stains, cold water gets laundry clean.
- Doing laundry in cold water conserves hot water.

The nine disadvantage items were:

- Some detergents dissolve better in hot water.
- Hot water kills germs better than cold water does.
- Hot water is more effective at removing stains.
- Laundry washed in hot water looks cleaner.
- Some detergents rinse out better in hot water.
- Laundry rinsed in hot water dries faster in the dryer.
- Washing in hot water keeps light colors from becoming dull and dingy looking.
- Some detergents work better in hot water.
- Hot water reduces the need for bleach and other laundry additives.
A five-point importance response format was used: "How important to you personally is it that ... ?" with response options ranging from "not important" (1) to "very important" (5). Respondents were also given the option of indicating that they did not agree with any given statement.

Operational Hypotheses

The operational hypotheses are expressed in terms of $D_k$ and $A_k$, where:

- $D_k$ refers to the mean importance of the disadvantages of cold water washing to respondents in stage of change $k$;
- $A_k$ refers to the mean importance of the advantages of cold water washing to respondents in stage of change $k$;

where the valid values of $k$ are:

- $P =$ precontemplation;
- $C =$ contemplation;
- $A =$ action;
- $M =$ maintenance;
- $R =$ relapse; and
- $T =$ termination.

Recall Hypothesis 1:

**Hypothesis 1**
For people in the precontemplation stage, the importance of disadvantages associated with the new behavior will exceed the importance of the advantages.

The operational statement of this hypothesis in the context of cold water washing is:

$$D_P > A_P$$

Recall Hypothesis 2a:

**Hypothesis 2a**
For people in the contemplation stage, the importance of disadvantages associated with the new behavior will equal the importance of the advantages associated with it.

The operational statement of this hypothesis in the context of cold water washing is:

$$D_C = A_C$$

Recall Hypothesis 2b:
Hypothesis 2b
People in the contemplation stage will view the advantages associated with the new behavior as being more important than will people in the precontemplation stage.

The operational statement of this hypothesis in the context of cold water washing is:

\[ A_C > A_P \]

Recall Hypothesis 2c:

Hypothesis 2c
People in the contemplation stage will view the disadvantages associated with the new behavior as being no more or less important than will people in the precontemplation stage.

The operational statement of this hypothesis in the context of cold water washing is:

\[ D_C = D_P \]

Recall Hypothesis 3a:

Hypothesis 3a
For people in the action stage, the importance of the disadvantages associated with the new behavior will be exceeded by the importance of the advantages associated with it.

The operational statement of this hypothesis in the context of cold water washing is:

\[ D_A < A_A \]

Recall Hypothesis 3b:

Hypothesis 3b
People in the action stage will view the advantages associated with the new behavior as being less important than will people in the contemplation stage.

The operational statement of this hypothesis in the context of cold water washing is:

\[ A_A < A_C \]

Recall Hypothesis 3c:

Hypothesis 3c
People in the action stage will view the disadvantages associated with the new behavior as being less important than will people in the contemplation stage.

The operational statement of this hypothesis in the context of cold water washing is:
Recall Hypothesis 4a:

**Hypothesis 4a**
For people in the maintenance stage, the importance of the disadvantages associated with the new behavior will be exceeded by the importance of the advantages associated with it.

The operational statement of this hypothesis in the context of cold water washing is:

\[ D_M < A_M \]

Recall Hypothesis 4b:

**Hypothesis 4b**
People in the maintenance stage will view the advantages associated with the new behavior as being less important than will people in the action stage.

The operational statement of this hypothesis in the context of cold water washing is:

\[ A_M < A_A \]

Recall Hypothesis 4c:

**Hypothesis 4c**
People in the maintenance stage will view the disadvantages associated with the new behavior as being less important than will people in the action stage.

The operational statement of this hypothesis in the context of cold water washing is:

\[ D_M < D_A \]

Recall Hypothesis 5a:

**Hypothesis 5a**
For people in the relapse stage, the importance of disadvantages associated with the new behavior will equal the importance of advantages associated with it.

The operational statement of this hypothesis in the context of cold water washing is:

\[ D_R = A_R \]

Recall Hypothesis 5b:
Hypothesis 5b
People in the relapse stage will view the advantages associated with the new behavior as being more important than will people in the maintenance stage and people in the action stage.

The operational statement of this hypothesis in the context of cold water washing is:

\[ A_R > A_M \text{ and } A_R > A_A \]

Recall Hypothesis 5c:

Hypothesis 5c
People in the relapse stage will view the disadvantages associated with the new behavior as being more important than will people in the maintenance stage or people in the action stage.

The operational statement of this hypothesis in the context of cold water washing is:

\[ D_R > D_M \text{ and } D_R > D_A \]

Recall Hypothesis 6a:

Hypothesis 6a
For people in the termination stage, the importance of disadvantages associated with the new behavior will be exceeded by the importance of advantages associated with it.

The operational statement of this hypothesis in the context of cold water washing is:

\[ D_T < A_T \]

Recall Hypothesis 6b:

Hypothesis 6b
People in the termination stage will view the advantages associated with the new behavior as being less important than will people in the maintenance stage.

The operational statement of this hypothesis in the context of cold water washing is:

\[ A_T < A_M \]

Recall Hypothesis 6c:

Hypothesis 6c
People in the termination stage will view the disadvantages associated with the new behavior as being less important than will people in the maintenance stage.

The operational statement of this hypothesis in the context of cold water washing is:
Summary

This chapter described a study designed to test the applicability of the Revolving Door Model of Behavior Change in the context of a specific demarketing problem: encouraging people to use cold (rather than hot or warm) water for laundry washing. The study had two components. The first part was designed to test whether people in the target market for a given demarketing program could be successfully classified into one of the six stages of change (precontemplation, contemplation, action, maintenance, relapse, and termination). The second part was designed to test whether the stages of change could be related to a decisional balance measure as predicted by several hypotheses based on the Revolving Door Model of Behavior Change and the results of a previous study (Velicer et al. 1985) on smoking.

The next chapter describes the data analysis and results of Study 1.
CHAPTER 6
STUDY 1: ANALYSIS AND RESULTS

The last chapter described a study designed to test the applicability of the Revolving Door Model of Behavior Change in the context of a specific demarketing problem: encouraging people to use cold (rather than hot or warm) water for laundry washing. This chapter describes the data analysis and results of Study 1.

The analysis proceeded in three stages. First, respondents were classified into the stages of change, based on their responses to the group of behavior and behavioral intention items described in Chapter 5. Then, the 19 decisional balance measures, also described in Chapter 5, were submitted to a principal component analysis to yield two scales, the Advantages of cold water washing and the Disadvantages of cold water washing. Finally, the hypotheses developed in Chapter 5 were tested, using cross sectional comparisons of the mean Advantages and Disadvantages scores by stage of change.

Assignment to Stages

Of the 340 qualifying respondents, 18 (5.3%) were unclassified due to missing data on one or more of the classification questions. Table 6-1 shows the distribution of the remaining 322 respondents across the stages of change.
Table 6-1
Assignment of Respondents to Stages of Change

<table>
<thead>
<tr>
<th>Stage</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precontemplation</td>
<td>103</td>
<td>32</td>
</tr>
<tr>
<td>Contemplation</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>Action</td>
<td>30</td>
<td>9</td>
</tr>
<tr>
<td>Maintenance</td>
<td>81</td>
<td>25</td>
</tr>
<tr>
<td>Relapse</td>
<td>18</td>
<td>6</td>
</tr>
<tr>
<td>Termination</td>
<td>75</td>
<td>23</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>322</td>
<td>100</td>
</tr>
</tbody>
</table>

The sample was not evenly distributed across the stages of change. Most respondents were in the precontemplation, maintenance and termination stages; together, these three stages account for just over 80% of respondents.

**Decisional Balance Measures**

Recall that in this dissertation research, the purpose of the decisional balance measures was to provide initial validation for the stages of change classification in a demarketing context. In their studies of smoking cessation, Velicer, et al. (1985) found significant differences in decisional balance among people in different stages of change. If the same pattern of results (as predicted in Hypotheses 1 to 6C, presented in Chapter 5) were to occur in the cold water washing survey, it would provide initial empirical evidence that the Revolving Door Model of Behavior Change generalizes to a demarketing context.

Respondents were asked to rate each of the 19 decisional balance items in terms of its importance to them in their own decision about what water temperature to use for doing laundry. They used a five-point rating scale, where "1" meant "not important" and "5" meant "very important." Respondents were also given the option of indicating that they did not agree with the
statement. In addition, some respondents said that they did not know how important an item was to them.

**Deletion of Items.** The first step in the analysis of the decisional balance measures was to examine responses to each item to determine whether any items had a high level of "disagree" and/or "don't know" responses, as many such responses for a particular item would indicate that the item was poorly worded, or incorrect, or otherwise problematic. Any item to which 20% or more of respondents said they disagreed with the statement or didn't know how important it was to them was eliminated from further analysis. Table 6-2 shows each of the 19 items in the questionnaire and indicates for each the number of "don't agree" responses, the number of "don't know" responses, and the decision to include or delete. (Items included in further data analysis are boldfaced.)

<table>
<thead>
<tr>
<th>Item</th>
<th>Disagree</th>
<th>DK</th>
<th>Total</th>
<th>%</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>48.</td>
<td>Washing in cold water saves energy.</td>
<td>8</td>
<td>5</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>49.</td>
<td>Some detergents dissolve better in hot water.</td>
<td>17</td>
<td>34</td>
<td>51</td>
<td>15</td>
</tr>
<tr>
<td>50.</td>
<td>Hot water kills germs better than cold water does.</td>
<td>33</td>
<td>11</td>
<td>44</td>
<td>13</td>
</tr>
<tr>
<td>51.</td>
<td>Cold water is less harmful to fabrics.</td>
<td>16</td>
<td>17</td>
<td>33</td>
<td>10</td>
</tr>
<tr>
<td>52.</td>
<td>Washing in cold water keeps colors bright.</td>
<td>25</td>
<td>18</td>
<td>43</td>
<td>13</td>
</tr>
<tr>
<td>53.</td>
<td>Washing in cold water prevents clothes from shrinking.</td>
<td>10</td>
<td>5</td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td>54.</td>
<td>Hot water is more effective at removing stains.</td>
<td>65</td>
<td>11</td>
<td>76</td>
<td>22</td>
</tr>
</tbody>
</table>

*There is no theory to guide the selection of a cut-off point; it is a matter of judgement. Here, a relatively conservative approach was taken, on the grounds that the scales that were to be the result of the principal component analysis were not an end in themselves; they were a means to investigate the applicability of the Revolving Door Model of Behavior Change in a demarketing situation. The more "disagree" and "don't know" responses an item had, the more error would be introduced.*
<table>
<thead>
<tr>
<th>Item</th>
<th>Disagree</th>
<th>DK</th>
<th>Total</th>
<th>%</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>55. Washing in cold water saves money.</td>
<td>8</td>
<td>7</td>
<td>15</td>
<td>4</td>
<td>include</td>
</tr>
<tr>
<td>56. Laundry washed in hot water looks cleaner.</td>
<td>79</td>
<td>16</td>
<td>95</td>
<td>28</td>
<td>delete</td>
</tr>
<tr>
<td>57. Some detergents rinse out better in hot water.</td>
<td>58</td>
<td>48</td>
<td>106</td>
<td>31</td>
<td>delete</td>
</tr>
<tr>
<td>58. Washing in cold water helps protect the environment.</td>
<td>35</td>
<td>42</td>
<td>77</td>
<td>23</td>
<td>delete</td>
</tr>
<tr>
<td>59. Detergents made especially for cold water work as well as other detergents work in hot water.</td>
<td>27</td>
<td>60</td>
<td>87</td>
<td>26</td>
<td>delete</td>
</tr>
<tr>
<td>60. Laundry rinsed in hot water dries faster in the dryer.</td>
<td>83</td>
<td>45</td>
<td>128</td>
<td>38</td>
<td>delete</td>
</tr>
<tr>
<td>61. Cold water prevents colors from running.</td>
<td>11</td>
<td>15</td>
<td>26</td>
<td>8</td>
<td>include</td>
</tr>
<tr>
<td>62. For all but really tough stains, cold water gets laundry clean.</td>
<td>43</td>
<td>18</td>
<td>61</td>
<td>18</td>
<td>include</td>
</tr>
<tr>
<td>63. Doing laundry in cold water conserves hot water.</td>
<td>4</td>
<td>5</td>
<td>9</td>
<td>3</td>
<td>include</td>
</tr>
<tr>
<td>64. Washing in hot water prevents light colors from becoming dull and dingy looking.</td>
<td>68</td>
<td>18</td>
<td>86</td>
<td>25</td>
<td>delete</td>
</tr>
<tr>
<td>65. Some detergents work better in hot water.</td>
<td>22</td>
<td>25</td>
<td>47</td>
<td>14</td>
<td>include</td>
</tr>
<tr>
<td>66. Hot water reduces the need for bleach and other laundry additives.</td>
<td>82</td>
<td>24</td>
<td>106</td>
<td>31</td>
<td>delete</td>
</tr>
</tbody>
</table>

Of the eight items deleted, six (items 54, 56, 57, 60, 64, 66) came from the list of disadvantages of cold water washing; two (items 58, 59) came from the list of advantages of cold water washing. The remaining pool included 11 items, eight of which (items 48, 51, 52, 53, 55, 61, 62) were written as advantages, and three of which (items 49, 50, and 51) were written as disadvantages.

**Principal Component Analysis.** The remaining 11 decisional balance items were submitted to principal component analysis to determine whether they represented two independent latent constructs (advantages and disadvantages of cold water washing). Only data from respondents who provided an importance response for each and every decisional balance item were included in the
principal component analysis (i.e., data from respondents who answered "disagree" or "don't know" to any item were excluded). Data from 173 of the 340 respondents were therefore submitted to principal component analysis.

To test whether factor analysis was appropriate for these data, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was computed. The KMO measure is an index for comparing the observed correlation coefficients to the partial coefficients. If the KMO measure is small, correlations between pairs of variables cannot be explained by the other variables, so factor analysis of the variables is inappropriate:

Kaiser (1974) characterizes measures in the 0.90's as marvelous, in the 0.80's as meritorious, in the 0.70's as middling, in the 0.60's as mediocre, in the 0.50's as miserable, and below 0.5 as unacceptable. (Norusis/SPSS Inc. 1992: 59)

The value of the overall KMO statistic for these data was 0.79. Since the KMO measure is close to 0.80, it was reasonable to proceed with the principal component analysis.

One of the important decisions in principal component analysis is how many components (or factors) to retain. There are several approaches to this issue. The most common approach is the Kaiser-Guttman Rule. According to this heuristic, the "true" number of components is equal to the number of eigenvalues greater than one. Steiger (1989) explains the rationale for this "mechanical" approach:

Since the size of an eigenvalue represents the variance "accounted for" by a principal component, and since the mean eigenvalue of a correlation matrix is one, the components corresponding to eigenvalues greater than one are "above average" in terms of variance accounted for. (Steiger 1989: 13-14)

For these data, three factors had eigenvalues greater than one (see Table 6-3).
Table 6-3
Factor Eigenvalues

<table>
<thead>
<tr>
<th>Factor</th>
<th>Eigenvalue</th>
<th>Percent of Variance</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3.67</td>
<td>33.4</td>
<td>33.4</td>
</tr>
<tr>
<td>2</td>
<td>2.04</td>
<td>18.5</td>
<td>51.9</td>
</tr>
<tr>
<td>3</td>
<td>1.15</td>
<td>10.4</td>
<td>62.4</td>
</tr>
</tbody>
</table>

The rotated and interpreted factor matrix including all three components with eigenvalues greater than one is presented in Table 6-4. Together, the three components account for 62.4% of the total variance of the decisional balance items.

Table 6-4
Rotated and Interpreted Factor Matrix
Including All Factors with Eigenvalues Greater Than One.

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1 Advantages (Fabric)</th>
<th>Factor 2 Advantages (Financial)</th>
<th>Factor 3 Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cold water prevents colors from running.</td>
<td>.79</td>
<td>.11</td>
<td>.10</td>
</tr>
<tr>
<td>Washing in cold water keeps colors bright.</td>
<td>.73</td>
<td>.18</td>
<td>.02</td>
</tr>
<tr>
<td>Washing in cold water prevents clothes from shrinking.</td>
<td>.66</td>
<td>.21</td>
<td>.06</td>
</tr>
<tr>
<td>Cold water is less harmful to fabrics.</td>
<td>.62</td>
<td>.42</td>
<td>.15</td>
</tr>
<tr>
<td>For all but really tough stains, cold water gets laundry clean.</td>
<td>.60</td>
<td>.21</td>
<td>-.42</td>
</tr>
<tr>
<td>Washing in cold water saves money.</td>
<td>.26</td>
<td>.83</td>
<td>-.02</td>
</tr>
<tr>
<td>Washing in cold water saves energy.</td>
<td>.14</td>
<td>.83</td>
<td>-.03</td>
</tr>
<tr>
<td>Doing laundry in cold water conserves hot water.</td>
<td>.24</td>
<td>.75</td>
<td>-.02</td>
</tr>
<tr>
<td>Some detergents dissolve better in hot water.</td>
<td>-.05</td>
<td>.04</td>
<td>.86</td>
</tr>
<tr>
<td>Some detergents work better in hot water.</td>
<td>-.03</td>
<td>-.03</td>
<td>.86</td>
</tr>
<tr>
<td>Hot water kills germs better than cold water does.</td>
<td>.30</td>
<td>-.03</td>
<td>.58</td>
</tr>
</tbody>
</table>
Note that factors (components) 1 and 2, while independent, are both interpretable as advantages of cold water washing, while factor (component) 3 is interpretable as disadvantages of cold water washing.

Another approach to determining the number of factors is to examine the scree plot (a plot of the total variance associated with each factor). The scree plot usually shows a distinct break between the steep slope of the factors that account for a large portion of the total variance and the gradual tailing off of the remaining factors. The idea underlying this approach is that, once the eigenvalues level off, the components are no longer distinct, and will be more difficult to interpret (Steiger 1989). The "true" number of factors is the number of factors in the steep slope. The scree plot for these data is shown in Figure 6-1.

**Figure 6-1**

Scree Plot

Based on the scree test, since the third factor is part of the gradual tailing off of the scree, the "true" number of factors is two. When only two components are extracted in a principal component analysis with varimax rotation, the results are well defined. The factor matrix is
presented in Table 6-5. Together the two components account for 51.9% of the total variance in the decisional balance items. This result compares favorably with the Velicer et al (1985) 24-item decisional balance instrument for smoking, which accounted for 40% of the total variance.

Table 6-5
Rotated and Interpreted Factor Matrix
When Two Factors Are Extracted

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1 Advantages</th>
<th>Factor 2 Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washing in cold water saves money.</td>
<td>.74</td>
<td>-.04</td>
</tr>
<tr>
<td>Cold water is less harmful to fabrics.</td>
<td>.74</td>
<td>.18</td>
</tr>
<tr>
<td>Doing laundry in cold water conserves hot water.</td>
<td>.68</td>
<td>-.05</td>
</tr>
<tr>
<td>Washing in cold water keeps colors bright.</td>
<td>.67</td>
<td>.07</td>
</tr>
<tr>
<td>Cold water prevents colors from running.</td>
<td>.66</td>
<td>.16</td>
</tr>
<tr>
<td>Washing in cold water saves energy.</td>
<td>.65</td>
<td>-.07</td>
</tr>
<tr>
<td>Washing in cold water prevents clothes from shrinking.</td>
<td>.63</td>
<td>.10</td>
</tr>
<tr>
<td>For all but really tough stains, cold water gets laundry clean.</td>
<td>.60</td>
<td>-.38</td>
</tr>
<tr>
<td>Some detergents work better in hot water.</td>
<td>-.05</td>
<td>.86</td>
</tr>
<tr>
<td>Some detergents dissolve better in hot water.</td>
<td>-.02</td>
<td>.85</td>
</tr>
<tr>
<td>Hot water kills germs better than cold water does.</td>
<td>.19</td>
<td>.60</td>
</tr>
</tbody>
</table>

The result of the two-factor principal components analysis with varimax rotation was well-defined, indicating that the two components are, in fact, independent. As expected, the first component is made up of items involved with the advantages of cold water washing and rinsing (and was therefore named Advantages); the second component is made up of items involved with the advantages of hot water washing. Since the advantages of hot water washing are unavailable when laundry is done in cold water, the second component can also be interpreted as the disadvantages of cold water washing (and was therefore named Disadvantages).

Another approach to deciding on how many factors to include involves examining the residual correlations. Ideally, all the residual correlations will be below .05, and most will be around .01 (Steiger 1989). In these data, 50.0% (28) of the residual correlations are greater than .05 for the
three-component model, and 52.0% (29) of the residual correlations are greater than .05 for the two-component model. Clearly, neither model is ideal.

Based on interpretation of the factors, inspection of the scree plot, the modest loss (10.4%) in explained variance in a two-component model versus a three-component model, and the minimal increase (2.0%) in the number of residual correlations greater than .05 in a two-component versus a three component model, the two-component model was adopted.

A related issue is the criterion for inclusion of an item in a given component. Here, the approach taken was to include all items with loadings greater than one-half of the largest loading for that component. Based on the results of the principal component analyses, all 11 remaining items were included. Two separate scales were formed, the Advantages of Cold Water Washing scale with eight items, and the Disadvantages of Cold Water Washing scale with three items. The two scales appear in Tables 6-6 and 6-7.

Table 6-6
Advantages of Cold Water Washing Scale

1. Washing in cold water saves money.
2. Cold water is less harmful to fabrics.
3. Doing laundry in cold water conserves hot water.
4. Washing in cold water keeps colors bright.
5. Cold water prevents colors from running.
6. Washing in cold water saves energy.
7. Washing in cold water prevents clothes from shrinking.
8. For all but really tough stains, cold water gets laundry clean.

Table 6-7
Disadvantages of Cold Water Washing Scale

1. Some detergents work better in hot water.
2. Some detergents dissolve better in hot water.
3. Hot water kills germs better than cold water does.

A respondent’s score on each scale was the unweighted average of his or her responses to the items on the scale.
Reliability of the Advantages and Disadvantages Scales. Cronbach’s coefficient alpha was used to assess the reliability of each scale. Again, only data from respondents who provided an importance response for each and every one of the eleven final decisional balance items were included in the analysis (i.e., data from respondents who answered "disagree" or "don’t know" to any of the final decisional balance items were excluded). Data from 224 respondents were therefore included in the reliability analyses. Alpha for the Advantages scale was .84; it was .71 for the Disadvantages scale. Reliabilities of .50 to .60 are sufficient for the early stages of research (Nunnally 1967, Peter 1979); these results are well above those levels.

Cross Sectional Comparisons

Treatment of Missing Data. To this point in the analysis, all missing data were dealt with through "listwise deletion of cases": only data from respondents who provided an importance response for each and every one of the eleven final decisional balance items were included in the analysis. In other words, all data from respondents who answered "disagree" or "don’t know" to any (even one) of the final decisional balance items were excluded. Listwise deletion of cases reduces the sample size considerably, but since the purpose of the analyses to this point was to purify measures, this conservative approach was appropriate.

From this point forward, a different approach to missing data was taken, in order to preserve statistical power. In the cross sectional analyses that follow, the Advantages and Disadvantages scores used are the scale value for each respondent, not the respondent’s responses to individual scale items. In other words, for a respondent who supplied an importance score of each of the eight Advantage items, the Advantages score would be the unweighted average of the responses to the eight items. Similarly, for a respondent who supplied an importance score for each of the three Disadvantage items, the Disadvantages score would be the unweighted average of the three items.
If a respondent answered "disagree" or "don't know" to, say, one of the Advantages scale items, deleting all the data from that respondent because of one missing importance rating would be unnecessarily conservative, especially since a scale value is used, rather than ratings of individual items. Using the unweighted mean of the remaining seven scale items would preserve the respondent's data without biasing his or her score (although the variance would be reduced).

Consequently, the approach taken here was to use the unweighted average of the scale items for which there is an importance score as long as the number of items for which an importance score is missing is less than half of the total number of items for that scale. Consequently, for the Advantages scale, the scale score is the unweighted average of the eight Advantages items if the respondent provided an importance score for each of the eight items; otherwise it is the unweighted average of the seven, six, or five items for which the respondent provided an importance score. Data from respondents who provided four or fewer importance scores for the Advantages items were not used in the following analyses. Similarly, for the Disadvantages scale, the scale score is the unweighted average of the three Disadvantages items if the respondent provided an importance score for each of the three items; otherwise, it is the unweighted average of the two items for which the respondent provided an importance score. Data from respondents who provided only one importance score for the Disadvantages items were not used in the following analyses.

Overview of the Cross Sectional Comparisons. Once respondents had been assigned to the stages of change based on their behavior and behavioral intentions, and their scores on the two decisional balance scales (Advantages and Disadvantages of cold water washing) had been calculated, the analysis turned to an examination of the pattern of the decisional balance measures across stages. Table 6.8 presents the means and standard deviations for the six stages of change on the two scales.
Table 6-8
Means and Standard Deviations of the Advantages and Disadvantages Scales by Stage of Change

<table>
<thead>
<tr>
<th>Stage</th>
<th>Scale</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precontemplation</td>
<td>Advantages</td>
<td>96</td>
<td>3.63</td>
<td>0.91</td>
</tr>
<tr>
<td></td>
<td>Disadvantages</td>
<td>92</td>
<td>3.97</td>
<td>1.00</td>
</tr>
<tr>
<td>Contemplation</td>
<td>Advantages</td>
<td>14</td>
<td>3.82</td>
<td>1.01</td>
</tr>
<tr>
<td></td>
<td>Disadvantages</td>
<td>15</td>
<td>4.21</td>
<td>0.78</td>
</tr>
<tr>
<td>Action</td>
<td>Advantages</td>
<td>30</td>
<td>4.24</td>
<td>0.61</td>
</tr>
<tr>
<td></td>
<td>Disadvantages</td>
<td>25</td>
<td>3.50</td>
<td>1.07</td>
</tr>
<tr>
<td>Maintenance</td>
<td>Advantages</td>
<td>81</td>
<td>4.24</td>
<td>0.63</td>
</tr>
<tr>
<td></td>
<td>Disadvantages</td>
<td>76</td>
<td>3.22</td>
<td>1.28</td>
</tr>
<tr>
<td>Relapse</td>
<td>Advantages</td>
<td>17</td>
<td>3.93</td>
<td>1.18</td>
</tr>
<tr>
<td></td>
<td>Disadvantages</td>
<td>18</td>
<td>3.24</td>
<td>1.39</td>
</tr>
<tr>
<td>Termination</td>
<td>Advantages</td>
<td>75</td>
<td>4.39</td>
<td>0.76</td>
</tr>
<tr>
<td></td>
<td>Disadvantages</td>
<td>67</td>
<td>2.87</td>
<td>1.38</td>
</tr>
<tr>
<td>Overall</td>
<td>Advantages</td>
<td>313</td>
<td>4.05</td>
<td>0.86</td>
</tr>
<tr>
<td></td>
<td>Disadvantages</td>
<td>293</td>
<td>3.45</td>
<td>1.27</td>
</tr>
</tbody>
</table>

The number of responses on the Advantages and Disadvantages scales differ in each stage, due to different numbers of "disagree" or "don't know" responses on the two scales.

Figure 6-2 presents the means arranged by stage of change.

**Difference Scores.** The difference between the Disadvantages and the Advantages scores was calculated. Positive values of the difference score would mean that respondents rated the Disadvantages of cold water washing as more important than the Advantages; negative values would mean that respondents rated the Advantages of cold water washing as more important than the Disadvantages. Table 6-9 shows the mean difference scores for each stage, in ascending order. It indicates that respondents in the termination, maintenance, action, and relapse stages rated the Advantages of cold water washing as more important than the Disadvantages, while respondents in the precontemplation and contemplation stages rated the Disadvantages of cold water washing as more important than the Advantages. This pattern is what would be expected, according to the Revolving Door Model of Behavior Change (refer to Figure 4-2). Respondents in precontemplation and contemplation are using hot water (excessive discretionary consumption), and consistent with their
behavior, they rate the Disadvantages of cold water washing as more important. Respondents in termination, maintenance, and action are all using cold water (conservation), and consistent with their behavior, they rate the Advantages of cold water washing as more important. Respondents in relapse are presently using hot water, but have used cold water in the past; on average, they rate the Advantages of cold water washing as more important than the Disadvantages, but not by a large margin. Typical of people in relapse, their behavior is not consistent with their ratings on the decisional balance measure.
Table 6-9
Ordered Mean Difference Scores By Stage of Change

<table>
<thead>
<tr>
<th>Stage</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Termination</td>
<td>-1.50</td>
<td>1.45</td>
<td>67</td>
<td>17.94</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Maintenance</td>
<td>-0.99</td>
<td>1.23</td>
<td>76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>-0.68</td>
<td>1.13</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relapse</td>
<td>-0.55</td>
<td>1.13</td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Precontemplation</td>
<td>0.31</td>
<td>1.31</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contemplation</td>
<td>0.41</td>
<td>1.33</td>
<td>14</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The hypotheses developed in Chapter 5 examine the cross sectional relationships in greater detail.

**Hypothesis 1.** The statement of Hypothesis 1 in theoretical terms is:

For people in the precontemplation stage, the importance of disadvantages associated with the new behavior will exceed the importance of the advantages.

The operational statement of this hypothesis in the context of cold water washing is:

\[ D_p > A_p \]

Hypothesis 1 was tested by comparing the mean Disadvantage score to the mean Advantage score for respondents in the precontemplation stage. As Table 6-10 shows, the mean Disadvantage score for respondents in the precontemplation stage was 3.97, while the mean Advantage score for the

---

9Recall that the operational hypotheses are expressed in terms of \( D_k \) and \( A_k \), where:

\[ D_k \text{ refers to the mean importance of the disadvantages of cold water washing to respondents in stage of change } k; \]

\[ A_k \text{ refers to the mean importance of the advantages of cold water washing to respondents in stage of change } k; \]

where the valid values of \( k \) are:

\[ P = \text{precontemplation}; \]
\[ C = \text{contemplation}; \]
\[ A = \text{action}; \]
\[ M = \text{maintenance}; \]
\[ R = \text{relapse}; \] and
\[ T = \text{termination}. \]
precontemplation group was 3.63. A t-test indicates that, as hypothesized, the Disadvantages score is greater than the Advantages score for respondents in the precontemplation stage ($t_{36} = -2.23, p = .01$).

### Table 6-10
**Disadvantages and Advantages Scores in the Precontemplation Stage**

<table>
<thead>
<tr>
<th>Decisional Balance Measure</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>p (1-tail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disadvantages</td>
<td>3.97</td>
<td>1.00</td>
<td>-2.23</td>
<td>.01</td>
</tr>
<tr>
<td>Advantages</td>
<td>3.63</td>
<td>0.91</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on this result, Hypothesis 1 is supported.

**Hypothesis 2a.** The statement of Hypothesis 2a in theoretical terms is:

For people in the contemplation stage, the importance of disadvantages associated with the new behavior will equal the importance of the advantages associated with it.

The operational statement of this hypothesis in the context of cold water washing is:

$$D_c = A_c$$

Hypothesis 2a was tested by comparing the mean Disadvantage score to the mean Advantage score for respondents in the contemplation stage. As Table 6-11 shows, the mean Disadvantage score for respondents in the contemplation stage was 4.21, while the mean Advantage score for the precontemplation group was 3.82. A t-test indicates that the Disadvantages score is not significantly different from the Advantages score for respondents in the contemplation stage ($t_{13} = -1.14, p = .27$).

### Table 6-11
**Disadvantages and Advantages Scores in the Contemplation Stage**

<table>
<thead>
<tr>
<th>Decisional Balance Measure</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disadvantages</td>
<td>4.21</td>
<td>0.78</td>
<td>-1.14</td>
<td>.27</td>
</tr>
<tr>
<td>Advantages</td>
<td>3.82</td>
<td>1.01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on this result, Hypothesis 2a is supported.
**Hypothesis 2b.** The statement of Hypothesis 2b in theoretical terms is:

People in the contemplation stage will view the advantages associated with the new behavior as being more important than will people in the precontemplation stage.

The operational statement of this hypothesis in the context of cold water washing is:

\[ A_c > A_p \]

Hypothesis 2b was tested by comparing the mean Advantages score for respondents in the contemplation stage with the mean Advantages score for respondents in the precontemplation stage. As Table 6-12 shows, the number of respondents with Advantages scores in the precontemplation stage (96) was much larger than the number of respondents with Advantages scores in the contemplation stage (14), so the Levene Test for Homogeneity of Variance was performed. According to the Levene Test, the variances of the Advantages scores in the two groups are not significantly different \( F_{1,108} = .31, p = .58 \), which satisfies the homogeneity of variance assumption for the \( t \)-test.

The mean Advantages score for respondents in the contemplation stage was 3.82, while the mean Advantages score for respondents in the precontemplation stage was 3.63. A \( t \)-test indicates that the two values are not significantly different \( t_{108} = -0.73, p = .23 \). This result does not support Hypothesis 2b.

<table>
<thead>
<tr>
<th>Table 6-12</th>
<th>Advantages Scores in the Contemplation and Precontemplation Stages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stage</strong></td>
<td><strong>Mean</strong></td>
</tr>
<tr>
<td>Contemplation</td>
<td>3.82</td>
</tr>
<tr>
<td>Precontemplation</td>
<td>3.63</td>
</tr>
</tbody>
</table>

Based on this result, Hypothesis 2b is rejected.

**Hypothesis 2c.** The statement of Hypothesis 2c in theoretical terms is:

People in the contemplation stage will view the disadvantages associated with the new behavior as being no more or less important than will people in the precontemplation stage.
The operational statement of this hypothesis in the context of cold water washing is:

\[ D_c = D_p \]

Hypothesis 2c was tested by comparing the mean Disadvantages score for respondents in the contemplation stage with the mean Disadvantages score for respondents in the precontemplation stage. As Table 6-13 shows, the number of respondents with Disadvantages scores in the precontemplation stage (92) was much larger than the number of respondents with Disadvantages scores in the contemplation stage (15), so the Levene Test for Homogeneity of Variance was performed. According to the Levene Test, the variances of the Advantages scores in the two groups are not significantly different \((F_{1,105} = 1.49, p = .23)\), which satisfies the homogeneity of variance assumption for the \(t\)-test.

The mean Disadvantages score for respondents in the contemplation stage was 4.21, while the mean Advantages score for respondents in the precontemplation stage was 3.97. A \(t\)-test indicates that, as hypothesized, the two values are not significantly different \((t_{105} = -0.88, p = .38)\).

**Table 6-13**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
<th>( t )</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contemplation</td>
<td>4.21</td>
<td>0.78</td>
<td>15</td>
<td>-0.88</td>
<td>.38</td>
</tr>
<tr>
<td>Precontemplation</td>
<td>3.97</td>
<td>1.00</td>
<td>92</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on this result, Hypothesis 2c is supported.

**Hypothesis 3a.** The statement of Hypothesis 3a in theoretical terms is:

For people in the action stage, the importance of the disadvantages associated with the new behavior will be exceeded by the importance of the advantages associated with it.

The operational statement of this hypothesis in the context of cold water washing is:

\[ D_A < A_A \]

Hypothesis 3a was tested by comparing the mean Disadvantage score to the mean Advantage score for respondents in the action stage. As Table 6-14 shows, the mean Disadvantage score for
respondents in the action stage was 3.50, while the mean Advantage score for the action group was 4.24. A $t$-test indicates that, as hypothesized, the Disadvantages score is significantly less than the Advantages score for respondents in the action stage ($t_{28} = 3.00, p < .01$).

**Table 6-14**

<table>
<thead>
<tr>
<th>Decisional Balance Measure</th>
<th>Mean</th>
<th>SD</th>
<th>$t$</th>
<th>$p$ (1-tail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disadvantages</td>
<td>3.50</td>
<td>1.07</td>
<td>3.00</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>Advantages</td>
<td>4.24</td>
<td>0.61</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on this result, Hypothesis 3a is supported.

**Hypothesis 3b.** The statement of Hypothesis 3b in theoretical terms is:

People in the action stage will view the advantages associated with the new behavior as being less important than will people in the contemplation stage.

The operational statement of this hypothesis in the context of cold water washing is:

$$A_a < A_c$$

Hypothesis 3b was tested by comparing the mean Advantages score for respondents in the action stage with the mean Advantages score for respondents in the contemplation stage.

The number of respondents with Advantages scores in the action stage (30) was larger than the number of respondents with Advantages scores in the contemplation stage (14), so the Levene Test for Homogeneity of Variance was performed. According to the Levene Test, the variances of the Advantages scores in the two groups are significantly different ($F_{1.42} = 5.13, p = .03$), which does not satisfy the homogeneity of variance assumption for the $t$-test. However, the $t$-test is robust to violations of homogeneity of variance assumption when $n_1 = n_2$. Consequently, a random sample was taken of 14 of the 30 respondents in the action stage, making the number of responses in the action and contemplation stages equal.

As Table 6-15 shows, the mean Advantages score for respondents in the action stage was 4.17, while the mean Advantages score for the random sample of respondents in the contemplation
stage was 3.82. A t-test indicates that the two values are not significantly different ($t_{26} = -1.06, p = .15$). This result does not support Hypothesis 3b.

Table 6-15
Advantages Scores in the Action and Contemplation Stages

<table>
<thead>
<tr>
<th>Stage</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
<th>t</th>
<th>p (1-tail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action</td>
<td>4.17</td>
<td>0.67</td>
<td>14</td>
<td>-1.06</td>
<td>.15</td>
</tr>
<tr>
<td>Contemplation</td>
<td>3.82</td>
<td>1.01</td>
<td>14</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on this result, Hypothesis 3b is rejected.

**Hypothesis 3c.** The statement of Hypothesis 3c in theoretical terms is:

People in the action stage will view the disadvantages associated with the new behavior as being less important than will people in the contemplation stage.

The operational statement of this hypothesis in the context of cold water washing is:

$$D_A < D_C$$

Hypothesis 3c was tested by comparing the mean Disadvantages score for respondents in the action stage with the mean Disadvantages score for respondents in the contemplation stage. As Table 6-16 shows, the number of respondents with Disadvantages scores in the action stage (25) was larger than the number of respondents with Disadvantages scores in the contemplation stage (15), so the Levene Test for Homogeneity of Variance was performed. According to the Levene Test, the variances of the Disadvantages scores in the two groups are not significantly different ($F_{1,38} = 2.31, p = .14$), which satisfies the homogeneity of variance assumption for the t-test.

The mean Disadvantages score for respondents in the action was 3.50, while the mean Disadvantages score for respondents in the contemplation stage was 4.21. A t-test indicates that, as hypothesized, the mean Disadvantage score for respondents in the action stage is less than the mean Disadvantages score for respondents in the contemplation stage ($t_{38} = 2.24, p = .02$).
Based on this result, Hypothesis 3c is supported.

**Hypothesis 4a.** The statement of Hypothesis 4a in theoretical terms is:

For people in the maintenance stage, the importance of the disadvantages associated with the new behavior will be exceeded by the importance of the advantages associated with it.

The operational statement of this hypothesis in the context of cold water washing is:

\[ D_M < A_M \]

Hypothesis 4a was tested by comparing the mean Disadvantage score to the mean Advantage score for respondents in the maintenance stage. As Table 6-17 shows, the mean Disadvantage score for respondents in the maintenance stage was 3.22, while the mean Advantage score for the maintenance group was 4.24. A t-test indicates that, as hypothesized, the Disadvantages score is significantly less than the Advantages score for respondents in the action stage \( t_{75} = 7.00, p < .001 \).

**Table 6-17**  
Disadvantages and Advantages Scores in the Maintenance Stage

<table>
<thead>
<tr>
<th>Decisional Balance Measure</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>p (1-tail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disadvantages</td>
<td>3.22</td>
<td>1.28</td>
<td>7.00</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Advantages</td>
<td>4.24</td>
<td>0.63</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on this result, Hypothesis 4a is supported.

**Hypothesis 4b.** The statement of Hypothesis 4b in theoretical terms is:

People in the maintenance stage will view the advantages associated with the new behavior as being less important than will people in the action stage.
The operational statement of this hypothesis in the context of cold water washing is:

\[ A_M < A_A \]

Hypothesis 4b was tested by comparing the mean Advantages score for respondents in the maintenance stage with the mean Advantages score for respondents in the action stage. As Table 6-18 shows, the number of respondents with Advantages scores in the action stage (81) was much larger than the number of respondents with Advantages scores in the maintenance stage (31), so the Levene Test for Homogeneity of Variance was performed. According to the Levene Test, the variances of the Advantages scores in the two groups are not significantly different \((F_{1,109} = 0.69, p = .41)\), which satisfies the homogeneity of variance assumption for the \(t\)-test.

The mean Advantages score for respondents in the maintenance stage was 4.24, while the mean Advantages score for respondents in the action stage was also 4.24. A \(t\)-test indicates that the two values are not significantly different \((t_{109} = .02, p = .49)\). This result does not support Hypothesis 4b.

**Table 6-18**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Mean</th>
<th>SD</th>
<th>(n)</th>
<th>(t)</th>
<th>(p) (1-tail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance</td>
<td>4.24</td>
<td>0.63</td>
<td>81</td>
<td>0.02</td>
<td>.49</td>
</tr>
<tr>
<td>Action</td>
<td>4.24</td>
<td>0.61</td>
<td>30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on this result, Hypothesis 4b is rejected.

**Hypothesis 4c.** The statement of Hypothesis 4c in theoretical terms is:

People in the maintenance stage will view the disadvantages associated with the new behavior as being less important than will people in the action stage.

The operational statement of this hypothesis in the context of cold water washing is:

\[ D_M < D_A \]

Hypothesis 4c was tested by comparing the mean Disadvantages score for respondents in the maintenance stage with the mean Disadvantages score for respondents in the action stage. As Table
6-19 shows, the number of respondents with Disadvantages scores in the maintenance stage (76) was larger than the number of respondents with Disadvantages scores in the action stage (25), so the Levene Test for Homogeneity of Variance was performed. According to the Levene Test, the variances of the Advantages scores in the two groups are not significantly different ($F_{1,99} = 2.00, p = .16$), which satisfies the homogeneity of variance assumption for the $t$-test.

The mean Disadvantages score for respondents in the maintenance stage was 3.22, while the mean Disadvantages score for respondents in the action stage was 3.50. A $t$-test indicates that the mean Disadvantage score for respondents in the maintenance stage is not significantly different from the mean Disadvantages score for respondents in the action stage ($t_{99} = 0.99, p = .16$). This result does not support Hypothesis 4c.

Table 6-19
Disadvantages Scores in the Maintenance and Action Stages

<table>
<thead>
<tr>
<th>Stage</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
<th>t</th>
<th>p (1-tail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance</td>
<td>3.22</td>
<td>1.28</td>
<td>76</td>
<td>0.99</td>
<td>.16</td>
</tr>
<tr>
<td>Action</td>
<td>3.50</td>
<td>1.07</td>
<td>25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on this result, Hypothesis 4c is rejected.

**Hypothesis 5a.** The statement of Hypothesis 5a in theoretical terms is:

For people in the relapse stage, the importance of disadvantages associated with the new behavior will equal the importance of advantages associated with it.

The operational statement of this hypothesis in the context of cold water washing is:

$$D_R = A_R$$

Hypothesis 5a was tested by comparing the mean Disadvantage score to the mean Advantage score for respondents in the relapse stage. As Table 6-20 shows, the mean Disadvantage score for respondents in the relapse stage was 3.24, while the mean Advantage score for the relapse group was 3.93. A $t$-test indicates that the Disadvantages score is significantly less than the Advantages score.
for respondents in the relapse stage ($t_{16} = 2.02, p = .03$). This result does not support Hypothesis 5a.

Table 6-20
Disadvantages and Advantages Scores in the Relapse Stage

<table>
<thead>
<tr>
<th>Decisional Balance Measure</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>p (1-tail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disadvantages</td>
<td>3.24</td>
<td>1.39</td>
<td>2.02</td>
<td>.03</td>
</tr>
<tr>
<td>Advantages</td>
<td>3.93</td>
<td>1.18</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on this result, Hypothesis 5a is rejected.

**Hypothesis 5b.** The statement of Hypothesis 5b in theoretical terms is:

People in the relapse stage will view the advantages associated with the new behavior as being more important than will people in the maintenance stage and people in the action stage.

The operational statement of this hypothesis in the context of cold water washing is:

$$A_R > A_M \text{ and } A_R > A_A$$

Hypothesis 5b was tested by comparing the mean Advantages score for respondents in the relapse stage with the mean Advantages scores for respondents in the maintenance and action stages.

The number of respondents with Advantages scores in the relapse stage (17) was smaller than the number of respondents with Advantages scores in the maintenance stage (81) or the action stage (30), so the Levene Test for Homogeneity of Variance was performed. According to the Levene Test, there are significant differences in the variances of the Advantages scores in the three groups ($F_{2,125} = 4.80, p = .01$), which does not satisfy the homogeneity of variance assumption for analysis of variance. However, analysis of variance is robust to violations of homogeneity of variance assumption when $n_1 = n_2 = \ldots = n_J$ (Glass and Hopkins 1984). Consequently, a random sample was taken of 17 of the 30 respondents in the action stage, and 17 of the 81 respondents in the maintenance stage, making the number of responses in the three stages equal.

As Table 6-21 shows, the mean Advantages score for respondents in the relapse stage was 3.93, while the mean Advantages score for the random samples of respondents in the action and
maintenance stages were 4.28 and 4.27, respectively. A one-way analysis of variance indicates that the three values are not significantly different ($F_{2,46} = .92, p = .40$). This result does not support Hypothesis 5b.

Table 6-21
Advantages Scores in the Relapse, Maintenance, and Action Stages

<table>
<thead>
<tr>
<th>Stage</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relapse</td>
<td>3.93</td>
<td>1.18</td>
<td>17</td>
<td>0.92</td>
<td>.40</td>
</tr>
<tr>
<td>Maintenance</td>
<td>4.27</td>
<td>0.59</td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>4.28</td>
<td>0.70</td>
<td>17</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on this result, Hypothesis 5b is rejected.

**Hypothesis 5c.** The statement of Hypothesis 5c in theoretical terms is:

People in the relapse stage will view the disadvantages associated with the new behavior as being more important than will people in the maintenance stage or people in the action stage.

The operational statement of this hypothesis in the context of cold water washing is:

$$D_R > D_M \text{ and } D_R > D_A$$

Hypothesis 5c was tested by comparing the mean Disadvantages score for respondents in the relapse stage with the mean Disadvantages scores for respondents in the maintenance and action stages.

The number of respondents with Disadvantages scores in the relapse stage (18) was smaller than the number of respondents with Disadvantages scores in the maintenance stage (76) or the action stage (25), so the Levene Test for Homogeneity of Variance was performed. According to the Levene Test, there are no significant differences in the variances of the Disadvantages scores in the three groups ($F_{2,116} = 1.34, p = .27$), which satisfies the homogeneity of variance assumption for analysis of variance.

As Table 6-22 shows, the mean Disadvantages score for respondents in the relapse stage was 3.24, while the mean Disadvantages scores for respondents in the action and maintenance stages were 3.50 and 3.22, respectively. A one-way analysis of variance indicates that the three values are not significantly different ($F_{2,116} = .49, p = .62$). This result does not support Hypothesis 5c.
Table 6-22
Disadvantages Scores in the Relapse, Maintenance, and Action Stages

<table>
<thead>
<tr>
<th>Stage</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relapse</td>
<td>4.83</td>
<td>1.10</td>
<td>18</td>
<td>0.49</td>
<td>.62</td>
</tr>
<tr>
<td>Maintenance</td>
<td>4.82</td>
<td>1.01</td>
<td>76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>5.04</td>
<td>0.84</td>
<td>25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on this result, Hypothesis 5c is rejected.

**Hypothesis 6a.** The statement of Hypothesis 6a in theoretical terms is:

For people in the termination stage, the importance of disadvantages associated with the new behavior will be exceeded by the importance of advantages associated with it.

The operational statement of this hypothesis in the context of cold water washing is:

$$D_T < A_T$$

Hypothesis 6a was tested by comparing the mean Disadvantage score to the mean Advantage score for respondents in the termination stage. As Table 6-23 shows, the mean Disadvantage score for respondents in the termination stage was 2.87, while the mean Advantage score for the termination group was 4.39. A t-test indicates that, as hypothesized, the Disadvantages score is significantly less than the Advantages score for respondents in the termination stage ($t_{65} = 8.42, p < .001$).

Table 6-23
Disadvantages and Advantages Scores in the Termination Stage

<table>
<thead>
<tr>
<th>Decisional Balance Measure</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disadvantages</td>
<td>2.87</td>
<td>1.38</td>
<td>8.42</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Advantages</td>
<td>4.39</td>
<td>0.76</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on this result, Hypothesis 6a is supported.

**Hypothesis 6b.** The statement of Hypothesis 6b in theoretical terms is:

People in the termination stage will view the advantages associated with the new behavior as being less important than will people in the maintenance stage.

The operational statement of this hypothesis in the context of cold water washing is:

$$A_T < A_M$$
Hypothesis 6b was tested by comparing the mean Advantages score for respondents in the termination stage with the mean Advantages score for respondents in the maintenance stage. As Table 6-24 shows, the number of respondents with Advantages scores in the maintenance stage (81) was larger than the number of respondents with Advantages scores in the termination stage (75), so the Levene Test for Homogeneity of Variance was performed. According to the Levene Test, the variances of the Advantages scores in the two groups are not significantly different ($F_{1,154} = 0.36, p = .55$), which satisfies the homogeneity of variance assumption for the $t$-test.

The mean Advantages score for respondents in the termination stage was 4.39, while the mean Advantages score for respondents in the maintenance stage was 4.24. A $t$-test indicates that the two values are significantly different ($t_{154} = -1.32, p = .09$) at the $\alpha = .10$ level of significance, but, contrary to Hypothesis 6b, the Advantages score for respondents in the termination stage was greater than the Advantages score for respondents in the maintenance stage. This result does not support Hypothesis 6b.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
<th>t</th>
<th>p (1-tail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Termination</td>
<td>4.39</td>
<td>0.76</td>
<td>75</td>
<td>-1.32</td>
<td>.09</td>
</tr>
<tr>
<td>Maintenance</td>
<td>4.24</td>
<td>0.63</td>
<td>81</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on this result, Hypothesis 6b is rejected.

**Hypothesis 6c.** The statement of Hypothesis 6c in theoretical terms is:

People in the termination stage will view the disadvantages associated with the new behavior as being less important than will people in the maintenance stage.

The operational statement of this hypothesis in the context of cold water washing is:

$$D_T < D_M$$

Hypothesis 6c was tested by comparing the mean Disadvantages score for respondents in the termination stage with the mean Disadvantages score for respondents in the maintenance stage. As
Table 6-25 shows, the number of respondents with Disadvantages scores in the maintenance stage (76) was larger than the number of respondents with Disadvantages scores in the termination stage (67), so the Levene Test for Homogeneity of Variance was performed. According to the Levene Test, the variances of the Advantages scores in the two groups are not significantly different ($F_{1,141} = .78, p = .38$), which satisfies the homogeneity of variance assumption for the t-test.

The mean Disadvantages score for respondents in the termination stage was 2.87, while the mean Disadvantages score for respondents in the maintenance stage was 3.22. A t-test indicates that, at the $\alpha = .10$ level of significance, the mean Disadvantage score for respondents in the termination stage is significantly less than the mean Disadvantages score for respondents in the maintenance stage ($t_{141} = 1.57, p = .06$). This result supports Hypothesis 6c at the .10 level of significance.

Table 6-25
Disadvantages Scores in the Termination and Maintenance Stages

<table>
<thead>
<tr>
<th>Stage</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
<th>t</th>
<th>p (1-tail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Termination</td>
<td>4.54</td>
<td>1.09</td>
<td>67</td>
<td>1.57</td>
<td>.06</td>
</tr>
<tr>
<td>Maintenance</td>
<td>4.82</td>
<td>1.01</td>
<td>76</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on this result, Hypothesis 6c is supported weakly.

Summary of Cross Sectional Results. Chapter 5 developed six hypotheses, each of which, with the exception of Hypothesis 1, has three parts. The first part of the hypotheses, Hypothesis Na, where N is the number of the hypothesis, predicts the relationship between the importance of the Advantages and Disadvantages of cold water washing for respondents in a given stage. As Table 6-26 shows, this part of the hypotheses was supported for five of the six stages of change: precontemplation, contemplation, action, maintenance, and termination. It was not supported for the relapse stage.
The second part of the hypotheses, Hypothesis Nb, predicts the relationship between the importance of the Advantages of cold water washing for respondents in a given stage of change and those in the preceding stage(s). As Table 6-26 shows, this part of the hypotheses was rejected for each of the stages of change.

The third part of the hypotheses, Hypothesis Nc, predicts the relationship between the importance of the Disadvantages of cold water washing for respondents in a given stage of change and those in the preceding stage(s). As Table 6-26 shows, this part of the hypotheses was supported for some stages of change: the relationship between contemplation and precontemplation, between action and contemplation, and between termination and maintenance.

<table>
<thead>
<tr>
<th>N</th>
<th>Relationship</th>
<th>Hypothesis Na</th>
<th>Hypothesis Nb</th>
<th>Hypothesis Nc</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hypothesized</td>
<td>$D_p &gt; A_p$</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>Actual</td>
<td>3.97 &gt; 3.63</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Significance</td>
<td>$p &lt; .05$</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Result</td>
<td>supported</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Hypothesized</td>
<td>$D_c = A_c$</td>
<td>$A_c &gt; A_p$</td>
<td>$D_c &gt; D_p$</td>
</tr>
<tr>
<td></td>
<td>Actual</td>
<td>4.21 &gt; 3.82</td>
<td>3.82 &gt; 3.63</td>
<td>4.21 &gt; 3.97</td>
</tr>
<tr>
<td></td>
<td>Significance</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td></td>
<td>Result</td>
<td>supported</td>
<td>rejected</td>
<td>supported</td>
</tr>
<tr>
<td>3</td>
<td>Hypothesized</td>
<td>$D_A &lt; A_A$</td>
<td>$A_A &lt; A_c$</td>
<td>$D_A &lt; D_c$</td>
</tr>
<tr>
<td></td>
<td>Actual</td>
<td>3.50 &lt; 4.24</td>
<td>4.17 &gt; 3.82</td>
<td>3.50 &lt; 4.21</td>
</tr>
<tr>
<td></td>
<td>Significance</td>
<td>$p &lt; .01$</td>
<td>n.s.</td>
<td>$p &lt; .05$</td>
</tr>
<tr>
<td></td>
<td>Result</td>
<td>supported</td>
<td>rejected</td>
<td>supported</td>
</tr>
<tr>
<td>4</td>
<td>Hypothesized</td>
<td>$D_M &lt; A_M$</td>
<td>$A_M &lt; A_A$</td>
<td>$D_M &lt; D_A$</td>
</tr>
<tr>
<td></td>
<td>Actual</td>
<td>3.22 &lt; 4.24</td>
<td>4.24 = 4.24</td>
<td>3.22 &lt; 5.50</td>
</tr>
<tr>
<td></td>
<td>Significance</td>
<td>$p &lt; .01$</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td></td>
<td>Result</td>
<td>supported</td>
<td>rejected</td>
<td>rejected</td>
</tr>
<tr>
<td>5</td>
<td>Hypothesized</td>
<td>$D_R = A_R$</td>
<td>$A_R &gt; A_M, A_A$</td>
<td>$D_R &gt; D_M, D_A$</td>
</tr>
<tr>
<td></td>
<td>Actual</td>
<td>3.24 &lt; 3.93</td>
<td>3.93 &lt; 4.27,4.28</td>
<td>(3.24 &gt; 3.22) &lt; 3.50</td>
</tr>
<tr>
<td></td>
<td>Significance</td>
<td>$p &lt; .05$</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td></td>
<td>Result</td>
<td>rejected</td>
<td>rejected</td>
<td>rejected</td>
</tr>
<tr>
<td>6</td>
<td>Hypothesized</td>
<td>$D_T &lt; A_T$</td>
<td>$A_T &lt; A_M$</td>
<td>$D_T &lt; D_M$</td>
</tr>
<tr>
<td></td>
<td>Actual</td>
<td>2.87 &lt; 4.39</td>
<td>4.39 &gt; 4.24</td>
<td>2.87 &lt; 3.22</td>
</tr>
<tr>
<td></td>
<td>Significance</td>
<td>$p &lt; .01$</td>
<td>$p &lt; .10$</td>
<td>$p &lt; .10$</td>
</tr>
<tr>
<td></td>
<td>Result</td>
<td>supported</td>
<td>rejected</td>
<td>supported</td>
</tr>
</tbody>
</table>
The next chapter discusses these results.

Summary

This chapter has described the data analysis and results of Study 1. First, respondents were classified into the stages of change. The 322 respondents for whom enough data was available to permit classification were not evenly distributed across the stages. Over 80% of respondents were in either the precontemplation, maintenance, or termination stages. Respondents in the contemplation, action, and relapse stages were less numerous.

The second task for analysis was to purify the decisional balance measures. Eight of the original 19 decisional balance items were deleted due to unacceptably high rates of "disagree" or "don't know" responses. The remaining 11 items were submitted to a principal component analysis, which yielded two scales, the Advantages of cold water washing and the Disadvantages of cold water washing.

Finally, the hypotheses developed in Chapter 5 were tested, using cross sectional comparisons of the mean Advantages and Disadvantages scores by stage of change. Eight of the 16 hypotheses developed in Chapter 5 were supported.

Chapter 7 examines the implications of the results reported here.
CHAPTER 7
STUDY 1: DISCUSSION

The previous two chapters described the design, analysis, and results of an exploratory study intended to test the applicability of the Revolving Door Model of Behavior Change in the context of a specific demarketing situation: energy conservation through the use of cold (rather than hot or warm) water for laundry washing. On the basis of their answers to a series of behavioral and behavioral intention questions, survey respondents were classified into one of six stages of change. Then, their importance ratings of a number of advantages and disadvantages of cold water washing were used to construct decisional balance scales. Finally, the decisional balance scales were analyzed across stages to determine whether the relationships hypothesized, which were based on results obtained in a previous empirical test of the Revolving Door Model of Behavior Change, actually occur in the energy conservation context. As Chapter 6 indicated, results were mixed.

This chapter discusses theoretical, methodological, and practical issues arising from Study 1. The organization of this chapter parallels that of the previous chapter: it examines first issues related to the classification of respondents to the stages of change, then discusses the operationalization of the decisional balance scales, and finally turns to an examination of the implications of the findings regarding the hypotheses.
Assignment to Stages of Change

There were no *a priori* expectations regarding the distribution of respondents across the stages of change, since this exploratory study was the first in an energy conservation situation to attempt to classify people into the stages of change. However, previous findings in other contexts suggest that some variation in the number of respondents per stage should be expected. For instance, McConnaughy et al (1989) found that the number of subjects in eight homogeneous client profiles corresponding to the precontemplation, contemplation, action, and maintenance stages of change varied from 18 to 70 (n = 293); and DiClemente et al (1991), in an analysis of the precontemplation, contemplation and preparation stages of change, found that the number of subjects per stage varied from 166 to 794 (n = 1466); and Velicer et al (1985) found that the number of subjects in the five groups they studied (immotive, contemplator, relapser, recent quitters, and long-term quitters) varied from 116 to 225 (n = 960).

The results of the laundry study likewise indicate that the distribution of respondents across the stages of change was very uneven. As Table 6-1 shows, the number of respondents per stage ranged from 15 to 103. This represents a relatively larger range than those in the studies cited above (here the ratio of largest to smallest n was almost 8:1, while in the DiClemente et al (1991) study the ratio of largest to smallest n was almost 5:1). While variability in the number of respondents across the stages of change was not unexpected, it does raise the question why there was so much variability, and what accounts for the pattern of variability. There are a number of possible explanations.

**Differential transience.** One explanation for the variability in the number of respondents across the stages of change is that people may spend more time in some stages than others, at least for cold water washing. In other words, people may stay in precontemplation for a long time, but once they move into contemplation, they may generally decide fairly quickly to take action. Once in the action stage, they may move along rapidly to maintenance, where they stay a long time. Relapse might also be relatively brief, possibly because relapers in the conservation context may
more commonly exit into precontemplation, rather than moving into contemplation again. Termination is, of course, a stable state, by definition; once there, people stay. A longitudinal study that tracks individuals’ movement through the stages would be the best way to test this explanation.

If, indeed, some stages of change are more transient than others, then it is important to understand why this is, if effective demarketing strategies are to be found. It may be that the transience is the result of previous marketing programs. For instance, marketing programs by BC Hydro, the environmental movement, and/or the makers of detergents formulated for use in cold water may have focused their efforts on action-oriented strategies, encouraging people to do something — to use cold water for their laundry. This strategy would encourage contemplators to move into action, and people in action to move into maintenance. If the Revolving Door Model of Behavior Change is appropriate in this situation, however, such strategies would be lost on precontemplators, who don’t see any need to even think about using cold water for their laundry. On the other hand, it may be that, for conservation behaviors in general, or perhaps for this conservation behavior in particular, some stages inherently take more time to travel through.

In either case, priority should be placed on processes of change that move people from precontemplation to contemplation, because once people get into contemplation, they are likely to move relatively quickly into action and then maintenance. Priority should also be placed on preventing people from slipping into relapse from maintenance, particularly if relapse usually leads to precontemplation. Unfortunately, as indicated in Chapter 4, the transitions from precontemplation to contemplation, and from maintenance into relapse are the least well understood in the Revolving Model of Behavior Change. More research is clearly needed in this area.

Low interest level. A second possible explanation for the uneven distribution of respondents across the stages of change is that the behavior studied has "had its day," and is no longer an issue receiving attention in most people’s lives. During the energy crisis of the 1970s, consumers were encouraged to undertake a variety of energy conservation behaviors, including cold water washing.
Many did switch to cold water washing. Some found that cold water washing was just as satisfactory as warm or hot water washing; others did not. In recent years, relatively little attention has been paid to energy conservation, particularly cold water washing. Thus it could be that people have some time ago decided where they stand vis a vis cold water washing: they either do it or they don’t, and they give little thought to it one way or the other.

If this explanation is valid, it would produce a distribution weighted towards precontemplators, who do not use cold water for laundry and have no plans to change, and maintainers and terminators, who do use cold water for laundry and have been doing so for some time. In fact, precontemplation, maintenance, and termination are the three most numerous groups.

If this explanation is valid, then, from a practical point of view, priority should be placed on making cold water washing an issue, so that there will be some movement from the precontemplation stage into the Revolving Door. This implication is consistent with those developed based on the possibility that the uneven distribution of respondents across stages might be due to people spending less time in some stages than others.

Methodological weaknesses. A third possible explanation is that the uneven distribution of respondents across the stages of change is due to methodological problems. For instance, note the large number of respondents in the precontemplation stage and small number (15) of respondents in the contemplation stage. Given that many people have positive attitudes towards energy conservation (even though their behavior may not reflect those attitudes), and that cold water washing is a good way to conserve energy, a relatively large number of respondents would be expected in the contemplation stage. Instead, contemplators make up the least numerous group.

It is possible that the operational definitions used in this research, though based on measures validated in other behavioral domains, were too strict for conservation behavior, leading to distortions in assignment of respondents to stages. The operational definitions focused only on cold water washing: respondents who might have previously rinsed with hot or warm water and now used cold
water for rinsing, and respondents who might now use warm water rather than hot would both be classified as being in the precontemplation stage, despite the fact that they had made behavioral changes that conserve energy. Thus some respondents, who may actually have been in the contemplation stage or even the action stage with respect to the real issue of conserving energy while doing the laundry, may have been inaccurately classified into precontemplation because their conservation behavior did not fit the strict definition used in this research.

Note that the questions used to classify respondents into the stages of change were based on criteria developed and validated for smoking cessation. While both smoking cessation strategies and energy conservation programs are aimed at decreasing consumption, there is an important difference in the goal. Smoking cessation strategies are aimed at reducing consumption of tobacco products to the point of eliminating it completely; energy conservation programs are aimed only at reducing discretionary consumption. By modeling the classification items on a situation in which the goal is elimination of consumption, this study may not have been sensitive enough to modest, but real, reductions in consumption of hot water. This lack of sensitivity may have inflated the number of precontemplation classifications.

Similarly, a six month horizon was chosen, again based on existing measures. While there does not seem to be any obvious reason why six months is an inappropriate horizon for cold water washing, a different period may have been more appropriate.

A strategy for deciding among the explanations. Three possible explanations have been proposed to account for the variability in the number of respondents per stage of change: it may be that people pass through some of the stages more quickly than others, or that the particular behavior examined in this experiment has had its day, or that the uneven distribution of respondents across the stages is an artifact of overly strict operational definitions. One or more of these explanations may be valid. Future research to account for the uneven distribution of respondents across stages should use a longitudinal study. By tracking individuals over time it would be possible to determine whether
people tend to spend more time in some stages than others. It would also be possible to determine whether people tend to stay in the same stage, which would suggest that cold water washing is a dead issue.

To overcome the limitations of the strict operational definitions of the stages of change, it would also be desirable to use a more realistic and multi-dimensional approach to assigning respondents to the stages of change. This will be discussed more fully later in this chapter.

**Decisonal Balance Measures**

Recall that of the 19 original items, eight were deleted due to high levels of "disagree" or "don’t know" responses. Principal component analysis on the remaining 11 items yielded two independent scales, one containing eight items describing advantages of cold water washing, and the other containing three items describing disadvantages of cold water washing. The principal component analysis did not yield a single bipolar scale, with the items describing the advantages of cold water washing receiving loadings of one sign and the items describing disadvantages receiving loadings of the opposite sign.

The emergence of two orthogonal components suggests that the ratings of the advantages of cold water washing are evaluated separately from the disadvantages. This finding provides more empirical support for a key aspect of the Janis and Mann (1977) theory of decision making, namely that decision making should be modeled as a comparative process, rather than as an absolute one. (Recall that the Velicer et al (1985) study, on which Study 1 was modeled, used Janis and Mann’s decisional balance theory to determine whether the Pros and Cons of Smoking could differentiate among five stages of change). Janis and Mann developed decisional balance theory to apply to important decisions, such as career choice, but the decision to use cold water for the laundry is a relatively unimportant one, so this result suggests that decisional balance theory generalizes beyond the important life decisions.
The content of the decisional balance scales represents a subset of the concerns about and reasons for using cold water washing identified in interviews and pretests with convenience samples of consumers. The Advantages scale contains items concerning financial and fabric-related reasons to use cold water for laundry. The Disadvantages scale contains items concerning performance-related reasons not to use cold water. Together, the two scales assess the salience of an individual's reasons for switching to cold water washing compared to the salience of the motives to continue to use hot water.

**Cross Sectional Comparisons**

The cross sectional comparisons examined differences between the Advantages and Disadvantages scores within the stages of change, as well as changes in the Advantages and Disadvantages scores between stages of change.

Figure 6-2 displays the mean Advantages and Disadvantages scores by stage of change. The pattern is largely consistent with the Revolving Door Model of Behavior Change. In the precontemplation stage, when the Revolving Door Model says that people are engaged exclusively in the old behavior (using hot or warm water for laundry washing) and have no intention of changing their behavior (to the use of cold water), precontemplation respondents to this survey, as expected, rated the Disadvantages of cold water washing as significantly more important than the Advantages (supporting Hypothesis 1a).

The Revolving Door Model says that in the contemplation stage, people have not changed their behavior, but have formed a serious intention to do so. In the Velicer et al (1985) survey, on which the hypotheses for this study were based, subjects in the contemplation stage viewed the Pros and Cons of smoking as being nearly in balance (i.e., not significantly different from each other). Similarly, in the laundry survey there were no significant differences between the Disadvantages of cold water washing and the Advantages as rated by respondents in the contemplation stage (supporting
Hypothesis 2a). However, the lack of significance may be attributable more to lack of power due to the small number of respondents (14) in the contemplation stage than to a genuine lack of difference.

The low number of respondents in the contemplation stage may also have led to the lack of a significant difference in both the Advantages and Disadvantages between the contemplation and precontemplation groups (leading to lack of support for both Hypothesis 2a and 2b). Although it is not statistically significant, there is an increase in the importance of both the Advantages and Disadvantages of cold water washing between the precontemplation and contemplation stages. An increase in the salience of the disadvantages of reducing discretionary consumption is consistent with the assertions made in Chapter 3 about how people experience breaking old habits (as opposed to developing new ones). (See Table 3-1 and the accompanying discussion). A longitudinal study could verify this explanation if it found that, as a respondent moves through the contemplation stage, the importance of the Advantages increases while the importance of the Disadvantages decreases.

In the action stage, the Revolving Door Model says that people have recently changed their behavior, are feeling good about the change, and are relatively confident about their ability to persist with the new behavior. Velicer et al (1985) found that, for recent quitters, the cons of smoking outweighed the pros, but both were of less importance than for subjects in contemplation. Similarly, in the laundry study, the Advantages of cold water washing were rated as significantly more important than the Disadvantages (supporting Hypothesis 3a). The change from the balance between the Advantages and Disadvantages in the contemplation stage to the clear superiority of the Advantages in the action stage was due to a significant decrease in the importance of the Disadvantages (supporting Hypothesis 3b) rather than any change in the importance of the Advantages (a finding that does not support Hypothesis 3a). This suggests that respondents in the action stage are no longer as acutely aware of the disadvantages of the behavior change. Without additional

See Churchill (1991) (page 774) for a discussion of the difference between statistical significance and practical significance.
research, the reasons for the shift in the relationship between the Advantages and the Disadvantages can only be a matter of speculation, but perhaps experience with cold water washing allayed some of the concerns respondents had with cold water washing.

The Revolving Door Model says that in the maintenance stage, people are working to continue with the behavior change. As people gain experience with the new behavior, the initial enthusiasm wears off, and maintaining the behavior change is more effortful. Velicer et al (1985) found that, for long term quitters, the cons of smoking outweighed the pros, but both the pros and cons of smoking were of less importance than they had been in the previous stage. In the laundry study, as expected, respondents in the maintenance stage rated the Advantages of cold water washing as more important than the Disadvantages (supporting Hypothesis 4a). However, only the Disadvantages decreased in importance, and not significantly (failing to support Hypothesis 4b); the Advantages remained at the same level of importance (failing to support Hypothesis 4a). These findings suggest that, as people gain experience with cold water washing, the Advantages remain salient, while the Disadvantages may become less salient.

The pattern of the Advantages and Disadvantages to this point in the analysis suggests that the Disadvantages of cold water washing loom large in peoples' minds if they are not using cold water; once they start using it, however, their worries seem to diminish, and continue to do so as they gain more experience with cold water washing.

The Revolving Door Model suggests that people who leave maintenance move either to relapse or to termination. Those who return to the old behavior after a period of engaging in the new behavior are said to be in relapse. Velicer et al (185) found that the smokers in relapse were like contemplators: the pros and cons of smoking were in balance. In the laundry study, while the Advantages and Disadvantages of cold water washing were in balance for respondents in the contemplation stage, they were not in balance for respondents in relapse (failing to support Hypothesis 5a). It was expected that both the Advantages and the Disadvantages would be more
salient to respondents in the relapse stage than in the maintenance or action stages, due to their reversion to the old behavior after some success with the new behavior, but there were no significant differences on either scale between relapse and either maintenance or action (failing to support both Hypothesis 5b and Hypothesis 5c).

People who eventually integrate the new behavior into their lives are said to be in termination. The Revolving Door Model predicts that in the termination stage, the importance of the advantages of the new behavior will exceed the disadvantages, and that the importance of both the advantages and the disadvantages will decrease compared to the maintenance stage, because in termination there is no longer any competition from the old behavior. In the laundry study, respondents in the termination stage rated the importance of the Advantages higher than the importance of the Disadvantages (supporting Hypothesis 6a). Also, the importance of the Disadvantages was lower than for respondents in the maintenance stage (supporting Hypothesis 6c). However, contrary to expectations (Hypothesis 6b), the importance of the Advantages actually increased. This implies that when cold water washing becomes a new habit-like behavior, the disadvantages associated with it become less salient, while the advantages become even more salient. Another possibility is that many of the people who wash and rinse all their laundry in cold water hold strong convictions about environmental and energy issues, so they would be convinced of the importance of the advantages of cold water washing.

Examining the results of Study 1 on a stage-by-stage basis, then, reveals that, while the results of the Velicer et al (1985) study were not completely reproduced, there was clearly convergence at several points. In addition, even where there was no convergence, it could be argued that the findings of Study 1 were not inconsistent with the Revolving Door Model of Behavior Change, but merely with the pattern of results found in the Velicer et al (1985) study.

It should also be noted that there were no significant differences between Advantages for adjacent stages. In contrast, there were significant differences between the Disadvantages between
contemplation and action, and between maintenance and termination. A larger number of respondents in the contemplation stage may also have revealed a significant difference between precontemplation and contemplation. Together, these results suggest that the salience of the advantages of cold water washing does not change much as people move through the stages of change. What does change is the importance of the disadvantages. It is not that people who use hot or warm water are unaware or unconvinced of the advantages of changing to cold water washing; it is just that they are concerned about the disadvantages. This finding suggests that promotional efforts aimed at reducing discretionary consumption of electricity through a switch from hot or warm water to cold should focus on addressing people’s concerns about the disadvantages of the change.

Issues Arising from Study 1

The purpose of Study 1 was exploratory: to get an indication whether the Revolving Door Model of Behavior, which was developed in a clinical setting to explain and predict the change behavior of people with harmful habits such as smoking, might also be applicable in a demarketing context. The results suggest that, in the case of cold water washing, the Revolving Door Model does not fit the data perfectly, but it does offer some promise.

Transfering the Revolving Door Model from clinical settings to a demarketing context was not particularly difficult, but it did identify some problems and raise some questions for future study. The first concerns the definitions used to classify respondents into the stages of change. The definitions were successful in the sense that most respondents (almost 95%) were classified, but, as noted in this chapter’s section on the classification of respondents, the operational definitions may have been too rigid. A more flexible and multidimensional approach to defining the stages may be useful. Consequently, to aid future work in this area, a new set of definitions is proposed below.
A second issue arising from Study 1 is difficulty of testing a model of behavior change using the "snapshot" of a cross-sectional study. This issue is also explored below, as is a third, related issue, which concerns the extent to which adjacent stages have meaningful borders.

A final issue is the need for theory in this area. This, too, is discussed below.

**Issue 1: Definitions of the Stages of Change**

Recall Chapter 5’s presentation of the operational definitions of the stages of change, which were based on a protocol used to classify people in the process of quitting smoking (Prochaska undated; see also DiClemente et al 1991):

**Definition 5.2**
*Precontemplation* is operationally defined as: no regular use of cold water wash and cold water rinse presently or six months ago, and no intention to use cold water wash and cold water rinse six months in the future.

**Definition 5.3**
*Contemplation* is operationally defined as: no regular use of cold water wash and cold water rinse presently or six months ago, but expectation of regular use six months in the future.

**Definition 5.4**
*Action* is operationally defined as: some regular use of cold water wash and cold water rinse at present, representing an increase over six months ago.

**Definition 5.5**
*Maintenance* is operationally defined as: some regular use of cold water wash and cold water rinse, at the same level as six months ago.

**Definition 5.6**
*Relapse* is operationally defined as: a reduction in the use of cold water wash and cold water rinse over the last six months.

**Definition 5.7**
*Termination* is operationally defined as: all loads for the past six months regularly done in cold water wash and cold water rinse.

These operational definitions worked well, in the sense that assignment of respondents to the stages of change based on their answers to the behavioral and behavioral intention items was
straightforward. All but 5.3% of respondents were successfully classified into one of the stages of change.

The operational definitions worked well because they are both mutually exclusive and collectively exhaustive. Table 7-1 shows that Definitions 5.2 to 5.7 are mutually exclusive. In addition, the definitions were collectively exhaustive for respondents who provided adequate data. All respondents who provided adequate data were classified; 5.3% of the sample did not provide cold water usage data for one or more of the time periods required and were therefore impossible to classify.

Table 7-1
Operational Definitions of the Stages of Change

<table>
<thead>
<tr>
<th>Stage</th>
<th>Use of Cold Water (CW)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Six Months Ago (t = -1)</td>
</tr>
<tr>
<td>Precontemplation</td>
<td>CW₁ = 0</td>
</tr>
<tr>
<td>Contemplation</td>
<td>CW₁ = 0</td>
</tr>
<tr>
<td>Action</td>
<td>CW₁ &gt; 0</td>
</tr>
<tr>
<td>Maintenance</td>
<td>CW₁ &gt; 0</td>
</tr>
<tr>
<td>Relapse</td>
<td>CW₁ &gt; 0</td>
</tr>
<tr>
<td>Termination</td>
<td>CW₁ = z, z = all</td>
</tr>
</tbody>
</table>

While the operational definitions are mutually exclusive and collectively exhaustive, they capture only the behavioral dimension of the differences among the stages of change. Since P&D provide much richer descriptions of the stages of change (e.g., Prochaska and DiClemente 1984, Prochaska, DiClemente, and Norcross 1992), the unidimensional approach used in the survey, while easy to administer, may have reduced the accuracy of the classifications. However, the only way to determine whether accuracy suffers significantly when a unidimensional classification strategy is used is to compare its results with a richer, multidimensional classification scheme.
Published studies by P&D supply the salient characteristics of people in the various stages. For instance, the following quote is typical of the vivid but informal descriptions of the stages of change provided by P&D.

*Precontemplation* is the stage at which there is no intention to change behavior in the foreseeable future. Many individuals in this stage are unaware or underaware of their problems. As G. K. Chesterton once said, "It isn't that they can't see the solution. It is that they can't see the problem." Families, friends, neighbors, or employees, however, are often well aware that the precontemplators have problems. When precontemplators present for psychotherapy, they often do so because of pressure from others. Usually they feel coerced into changing the addictive behavior by a spouse who threatens to leave, an employer who threatens to dismiss them, parents who threaten to disown them, or courts who threaten to punish them. They may even demonstrate change as long as the pressure is on. Once the pressure is off, however, they often quickly return to their old ways. . . Resistance to recognizing or modifying a problem is a hallmark of precontemplation. (Prochaska, DiClemente, and Norcross 1992: 1103)

Such descriptions, while offering a good intuitive "feel" for the stages of change, provide neither systematic, multidimensional descriptions nor a clear delineation of what differentiates one from another. For instance, the transition from contemplation to action is marked by a change in behavior, but the transition from action to maintenance is more an internal matter: the action stage is like a "honeymoon" period, when the new less excessive behavior is relatively easy to perform and relatively rewarding, simply because it is so new that it is attention-getting; the maintenance stage occurs when persevering with the new behavior becomes relatively effortful and relatively less rewarding.

A fuller, multidimensional, systematic description of the characteristics of each stage is needed. McConnaughy et al (1989) have partially addressed this issue with their Stages of Change Scales, which use a series of 32 items (eight items for each of the first four stages) that tap respondents' beliefs and attitudes, rather than relying strictly on behavior and behavioral intentions to classify respondents into the precontemplation, contemplation, action, and maintenance stages. The
operational definitions that underlie the items are not made explicit, and items are not provided for the relapse or termination stages.

In an effort to fill the kinds of definitional gaps that have been outlined above, the following conceptual and operational definitions are proposed for use in future research, based on the descriptions of the stages of change provided by P&D supplemented by descriptions and findings from research on relapses and their prevention. Each definition covers several dimensions: behavior, behavioral intentions, attitude toward the old behavior, and attitude toward the new behavior. In addition, for stages of change in which there has been a change in behavior (i.e., in action, maintenance, relapse, and termination), the definition also covers beliefs about lapses. The concept of a lapse is important in the recent relapse literature (e.g., Marlatt and George 1990, Marlatt and Gordon 1985) and is defined for the purposes of this research in Definition 7.1.

**Definition 7.1**
A lapse is a single instance, usually unintentional, of a return to the old pattern of behavior.

Definitions 7.2 to 7.7 describe the six stages of change.

**Definition 7-2**
In the precontemplation stage, people are engaging in the old behavior. They have no intention of changing their behavior. Their attitude toward the old behavior is favorable, while their attitude toward the new behavior is unfavorable.

**Definition 7-3**
In the contemplation stage, people continue to engage in the old behavior. They have formed a serious intention to change, but have not yet acted on it. Their attitude toward the old behavior is favorable, but not as favorable as it was in precontemplation. Their attitude toward the new behavior is favorable.

**Definition 7-4**
In the action stage, people begin to engage in the new behavior in a significant (to them) way; they either do not have lapses or do not notice them. Their intention is to continue to engage in the new behavior. Their attitude toward the old behavior is unfavorable. Their attitude toward the new behavior is very favorable. They believe that they are unlikely to lapse.
**Definition 7-5**
In the *maintenance* stage, people continue to engage in the new behavior; they have lapses and they notice them. They return to the new behavior after each lapse. Their intention is to continue to engage in the new behavior. Their attitude toward the old behavior is unfavorable. Their attitude toward the new behavior is favorable, but less favorable than it was in the action stage. They believe that lapses are inevitable and forgivable, and can be overcome.

**Definition 7-6**
In the *relapse* stage, people revert to the old behavior after an escalating series of lapses. They have no serious intention of returning to the new behavior in the near future. Their attitude toward the old behavior is favorable. Their attitude toward the new behavior is less favorable than it was in the maintenance stage. They believe that lapses represent failure. They have given up (at least temporarily) trying to change.

**Definition 7-7**
In the *termination* stage, people consistently engage in the new behavior; they have few, if any, lapses. They intend to continue to engage in the new behavior. Their attitude toward the old behavior is unfavorable. Their attitude toward the new behavior is favorable. They believe that lapses occur only in unusual circumstances, and are confident that, in the event of a lapse, they will be able to return to the new behavior.

While the behavior and behavioral intention measures may be adequate proxies for other dimensions of the stages of change in smoking behavior, they may be inadequate when the stages of change are applied to new areas. For instance, the behavioral classification scheme used in Study 1 would assign a person who had been doing, say, one third of his or her laundry in cold water for one month to the action stage. However, if that person started to forget occasionally — and therefore to feel a bit annoyed with him- or herself — to turn the washing machine’s temperature dial back to cold-wash-cold-rinse, then that person should properly be classified as being in the maintenance stage. An instrument based on the multidimensional definitions presented here might increase confidence that people are being classified appropriately.

The multidimensional definitions proposed here should be further elaborated to take into account the research advances expressed in the Spiral Model (Prochaska, DiClemente, and Norcross 1992). Given that people gain experience as they cycle through the stages of change, their attitudes
and intentions, and their perceptions of the relative importance of the advantages and disadvantages of change, may be different the first time they go through a given stage from the second time or the \(n\)th time.

### Issue 2: Dynamic Nature of the Model

The Revolving Door Model of Behavior Change describes the stages people go through in changing behavior. Since people move through these stages over time, and not everyone is the same, different people may move through a given stage at different rates.

To cope with this problem, the Revolving Door Model can be expressed mathematically as a two-state Markov model, as shown in Table 7-2. Given valid and reliable measures of the stages of change, transition probabilities can be estimated by repeated measures of the same individuals in a longitudinal study. Furthermore, the use of appropriate change processes in a demarketing program should selectively increase some of the transition probabilities. This, too, could be tested, probably in a field experiment.

### Table 7-2
Markov Model: Likely Transition Probabilities

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>(P)</th>
<th>(C)</th>
<th>(A)</th>
<th>(M)</th>
<th>(R)</th>
<th>(T)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(P)</td>
<td>(P)</td>
<td>(p_{PP})</td>
<td>(p_{PC})</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>(C)</td>
<td>(p_{CP})</td>
<td>(p_{CC})</td>
<td>(p_{CA})</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>(A)</td>
<td>0</td>
<td>0</td>
<td>(p_{AP})</td>
<td>(p_{AM})</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(M)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>(p_{MP})</td>
<td>(p_{MR})</td>
<td>(p_{MT})</td>
<td></td>
</tr>
<tr>
<td>(R)</td>
<td>(p_{RP})</td>
<td>(p_{RC})</td>
<td>0</td>
<td>0</td>
<td>(p_{RR})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(T)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Expressing the Revolving Door Model of Behavior Change as a Markov model would make it possible to identify where the demarketing emphasis should be put, determine whether a demarketing program (or any change process) is effective at moving people through the stages of change, how
effective it is at each transition, and over what transitions it is most effective. Ideally, the procedure would involve, first, measuring the baseline transition probabilities. This would require a longitudinal study. The probability associated with a given transition would be the proportion of people who make the transition. It would be prudent to take that measurement several times to get a mean value for each transition probability. These mean values would identify any bottlenecks (relatively low transition probabilities). Bottleneck transitions would be a logical target for demarketing programs. For instance, if the probability that a person would move from contemplation into action were significantly lower than the probability that a person would move from precontemplation into contemplation, then demarketing programs should be designed to get people who are thinking about a change to actually do it, rather than attempting to get people to consider changing.

Once demarketing programs were operating, their effectiveness could be measured by comparing the mean transition probabilities before demarketing with the mean transition probabilities after. Other things being equal, a significant increase in any transition probability would indicate that demarketing was effective in moving people between those stages; no significant difference would indicate that demarketing was ineffective; and a significant decrease would indicate that the demarketing did more harm than good.

**Issue 3: Fuzzy Borders**

Another, related issue is that the stages of change are discrete approximations of a continuous process. People do not, at a particular moment, instantaneously change from, say, action to maintenance. Moreover, there is change within a stage. A person who has just entered, say, the action stage from the contemplation stage has much less experience with the new behavior than he or she will later, when he or she is about to leave the action stage for the maintenance stage. This continuity makes it difficult to identify a point at which a person crosses from one stage to the next.
McConnaughy et al (1989) use a continuous measure, rather than a discrete measure like the one used in this study. Their 32-item scale is made up of eight items for each of the following stages of change: precontemplation, contemplation, contemplation, and action. Subjects responded to all 32 items. The resulting data were submitted to a cluster analysis, which yielded eight clusters, each of which had a different profile. For instance, the Contemplation Cluster is described as:

above average on Contemplation, below average on Precontemplation, well below average on Action, and about average on Maintenance. (McConnaughy et al 1989: 499-500)

While the discrete approach to measurement is appropriate for exploratory research such as that conducted in Study 1, the continuous approach to measurement should be seriously considered for future research in this area. The Stages of Change Scale developed by McConnaughy et al (1989) should, therefore, be expanded to include items for relapse and termination. In addition, the operational definitions of the stages of change should be made explicit.

Issue 4: The Need for Theory

The Revolving Door Model of Behavior Change is an empirically-driven model. Put very simply, P&D gathered data on behavior, behavioral intentions, attitudes, and other dimensions for people involved in changing their behavior. They then subjected this data to principal component analyses and cluster analyses, which yielded the stages of change. These analyses have brought order to a very confused and confusing area.

The Revolving Door Model of Behavior Change is primarily a descriptive model. P&D’s processes of change\textsuperscript{11} explain when and how the Revolving Door works, but more theory is needed to explain why the process works this way. The next part of this dissertation begins to address the need for more theory concerning changing habitual and habit-like behavior.

\textsuperscript{11}See Chapter 4 for a summary of P&D’s research in this area.
Summary

This chapter has discussed some of the theoretical, methodological, and practical issues arising from Study 1. The chapter began with an examination of possible reasons for the uneven distribution of respondents across the stages of change. Three possible explanations were discussed: that, on average, people pass through some stages more quickly than others; that cold water washing is a behavior about which most people have made up their minds; and that there were methodological difficulties.

The chapter then turned to a brief discussion of some of the implications of the results of the analysis of the decisional balance items. It was pointed out that the emergence of two orthogonal components, rather than one component on which items loaded either positively or negatively, suggests that respondents to this survey made laundry water temperature decisions based on a comparison of the advantages and disadvantages associated with cold water washing.

Following that was a discussion of the implications of the cross sectional comparisons. Although the Revolving Door Model of Behavior Change did not fit the data perfectly, there were enough points of agreement to suggest that the Revolving Door Model does offer some promise.

The chapter concluded with an examination of some of the problems with Study 1 and some of the questions it raised for future research, specifically: the need for a more flexible and multidimensional approach to defining the stages of change (to that end a new set of definitions was proposed); the effects of the dynamic nature of the stages of change (the expression of which was suggested through a two-state Markov model); the implications of the fact that the Revolving Door Model is a discrete approximation of a continuous process (the primary implication being that continuous measures are most appropriate); and that there is a need for more theory in the area of habitual and habit-like behavior change. The next part of the dissertation begins to develop and test some theory in that area.
CHAPTER 8
CHANGING COMPLEX, HABIT-LIKE BEHAVIORS

Recent improvements in energy efficiency and a shift towards less energy-intensive sectors have helped limit consumption. But the process must be accelerated to reduce per capita consumption... (World Commission on Environment and Development 1987: 59)

It has been argued in this dissertation that the demarketing task — to encourage people to reduce their discretionary consumption of certain good products — is essentially a matter of encouraging people to change their consumption habits. Habits and habit-like behaviors pervade human lives. At any given time, it seems that most people have at least a few habits they would like to change, or are trying to change, or have tried to change. In fact, in North America, the common determination to break bad habits has become ritualized in the annual "New Year's Resolutions."

Given the level of concern with and amount of effort devoted to changing habits and habit-like behaviors, there are surprisingly few comprehensive theories on the subject.

One exception is the work of Prochaska and DiClemente and their colleagues (reviewed in Chapter 4), whose Revolving Door Model of Behavior Change, a test of which has been described and discussed in Chapters 5 to 7, does seem to hold some promise for understanding the dynamics of behavior change in demarketing contexts. However, since P&D's model is essentially descriptive and based on empirical observation of thousands of people attempting to change such habit-like
behaviors as smoking and eating, even it cannot properly be called a general, truly *theory-driven* approach to changing habits and habit-like behavior. The problem is that, even though there may be a correlation between certain behavior change strategies and changes in habit-like behaviors, without underlying causal explanations we cannot be confident that it really was the behavior change strategies that produced the observed changes.

This chapter begins to fill the theory gap. It starts with a brief review of the psychology literature related to habit change that reveals that, while there are programs applicable to various specific habits or habit-like behaviors, there seem to have been few attempts to gain a more general understanding of the underlying processes. The chapter then turns to developing theory on changing habits and habit-like behaviors, based on what is known about the nature of habits and habit-like behavior (reviewed in Chapter 3).

**Changing Habit-Like Behavior: An Overview of the Literature**

The clinical psychology literature contains many articles on changing such habits as hair-pulling (e.g., Qureshi 1990), lip-biting (e.g., Ellis 1986), nail-biting (e.g., Leung and Robson 1990, Silber and Haynes 1992), nose-picking (e.g., Pianta and Hudson 1990), and thumb-sucking (e.g., Friman and Leibowitz 1990, Luciano, Vilchez, and Herruzo 1992). As well, there are extensive literatures (both scientific and popular) on changing eating habits, and on overcoming various extreme habits such as addictions to tobacco, alcohol, and pharmaceuticals. In most cases, the change strategies are specific to the habit at issue; there seem to have been few attempts to identify and take advantage of commonalities across the habit change situations. An exception is the *habit reversal* method (Azrin and Nunn 1973).

**Habit Reversal.** Azrin and Nunn (1973) propose a set of procedures to overcome nervous habits and tics. The procedures are based on assumptions about the source of nervous habits and tics, which Azrin and Nunn suggest begin as normal reactions to extreme events or personal traumas. For
some reason, the behavior persists beyond the injury or trauma and becomes part of normal movement. Azrin and Nunn then propose that habit reversal requires several "methods of treatment":

The client should learn to be aware of every occurrence of the habit. Each habit movement should be interrupted so that it no longer is part of a chain of normal movements. A physically competing response should be established to interfere with the habit. . . . Social reinforcement should be reversed or eliminated. (Azrin and Nunn 1973: 620)

There are several procedures required to accomplish habit reversal. To begin with, the individual needs to become aware of every occurrence of the habit. To that end, he or she records the incidence of the habit, and a validating report is obtained from an appropriate observer. In addition, the individual is required to describe in detail the physical manifestations of the habit, and is taught to detect each instance of the habit, as well as its earliest sign. The individual is also made aware of situations in which the habit is likely to occur, by recalling past performances of the habit.

Once the individual is aware of the habit, a competing response is developed. The competing response is a behavior that is incompatible with the habit, can be maintained for several minutes (until the urge to perform the habitual behavior passes), raises the individual's awareness of both the habit and the competing response, and is both socially inconspicuous and compatible with normal ongoing activities. The exact nature of the competing response, of course, depends on the habit.

Azrin and Nunn also emphasize the importance of motivation:

Preliminary efforts with other clients had indicated that little success would result if the client was only casually interested in eliminating his habit. Sufficiently strong motivation was indicated if the adult client sought out the treatment himself, rather than being urged to do so by others. (Azrin and Nunn 1973: 624)

They suggest a number procedures to maintain and increase motivation to change. One is to review with the individual, in detail, the inconveniences, embarrassment, and suffering that have resulted from the habit. Another procedure is to increase social support for efforts to change through positive comments by family and friends.
To ensure that the habit reversal is not confined to counselling sessions, but also generalizes to everyday situations, the individual imagines situations in which the habit is likely to occur, imagines that he or she detects a habit movement, and practices the competing response.

The habit reversal method was initially tested on 12 subjects with various nervous habits and tics, including head jerking, shoulder jerking, head-shaking, tongue-pushing, lisping, eye-lash picking, thumb-sucking, and fingernail biting. The results were impressive: performance of the habit was reduced by at least 90% for all subjects, and for ten of the 12 subjects, the habit was completely absent by the third week of treatment. (A modified procedure was subsequently developed for nail-biting.) Since publication of the Azrin and Nunn (1973) paper, the habit reversal technique, and variations on it, have been employed a number of times (e.g., Christensen and Sanders 1987, Weick et al 1988, Azrin and Peterson 1990) with mixed success.

There is clearly some convergence between Azrin and Nunn’s habit reversal procedure, particularly in the area of motivation, and P&D’s Revolving Door Model of Behavior Change. Azrin and Nunn (1973) point out that the individual who seeks treatment on his or her own initiative is more likely to be successful in overcoming the habit than people who seek treatment because they are urged to do so by others. This observation echoes P&D’s distinction between the precontemplation stage, in which people are not convinced that there is a real need for them to change their behavior, even though others might be strongly urging them to change, and the contemplation stage, in which people become convinced that they ought to change. In addition, Azrin and Nunn advocate enhancing motivation through a detailed review of the inconveniences, embarrassment, and suffering that have resulted from the habit. In the context of Study 1 of this dissertation, this procedure would correspond to increasing awareness and salience of the disadvantages associated with the old behavior. Similarly, Azrin and Nunn suggest increasing social support for efforts to change through positive comments by family and friends. In the context of Study 1, this procedure would correspond to increasing the awareness and salience of the advantages of the new behavior.
The convergence between the Revolving Door Model and the habit reversal procedure can be taken as an indication that there is some understanding of the habit change process. However, while the P&D Revolving Door Model of Behavior Change describes what happens as habitual and habit-like behavior changes, and Azrin and Nunn’s habit reversal procedure explains how to make it happen, neither approach explains why the habitual behavior change process happens as it does, nor why a procedure such as habit reversal might work. Such explanations might have more than theoretical value; they might suggest other techniques that might also be effective, even in other contexts. The remainder of this chapter is devoted to developing theory to explain why and how habitual and habit-like behavior changes, based on what is known about the characteristics of habitual and habit-like behavior.

Pre-Emptive Habitual and Habit-Like Behavior Change

Recall, from Chapter 3, that a habit is a pattern of activity that has, through extensive repetition, become automated, fixed, and effortless, and occurs without conscious awareness or consideration of alternatives (Definition 3.1), and habit-like behavior is a pattern of behavior that has been so well practised that its execution requires little or no attention (Definition 3.2). Habit-like behavior has a number of properties, one of which is that it is initiated by one or more "triggers" — stimuli that activate the automated processes that characterize habit-like behavior. It stands to reason that if the trigger(s) can be removed, the habitual or habit-like behavior would not occur, as Proposition 8.1 indicates.

**Proposition 8.1**
Inhibition of the trigger(s) that initiate a habitual or habit-like behavior will prevent the performance of that habitual or habit-like behavior.

Inhibiting the trigger(s) of a habitual or habit-like behavior would have two requirements. First, it would be necessary to identify the trigger(s). There may be multiple triggers for a single habitual or habit-like behavior in a single individual, any one of which could elicit the behavior. For
instance, someone who needs and wants to reduce the amount of fat in his or her diet might, despite intentions to the contrary, be triggered to eat ice cream by boredom, or loneliness, or the need to pamper him- or herself. In addition, the trigger(s) may vary from one person to the next. For instance, another person, also intending to cut down on dietary fat might be triggered to eat ice cream by seeing an ice cream store on a hot day, or by the fact that it is time for dessert and "we always have ice cream for dessert."

Since a single individual may be triggered to perform a habit or habit-like behavior by more than one stimulus, and since different individuals may be triggered by different stimuli, successful inhibition of a trigger-inhibition strategy would need, at minimum, the ability to identify and target segments based on trigger. For many habitual and habit-like behaviors, individual and individualized attention would be desirable to implement the inhibition strategy successfully. Such opportunities are likely to be scarce, especially for demarketers, who often do not have direct and personal access to the people whose behavior they are attempting to change.

Identifying the trigger(s) would not, by itself, be sufficient to prevent instances of the habitual or habit-like behavior. The second requirement for inhibition of the habitual or habit-like behavior is gaining control of the trigger. This would often be difficult. For instance, low blood sugar is often a trigger for eating sugary food high in fat. Demarketing dietary fat might therefore involve helping people avoid low blood sugar, but since different people have different metabolisms and different eating habits, a different strategy would be desirable for each person, for maximum effectiveness. The delivery of such idiosyncratic strategies would usually be impractical.

Even if the difficulties associated with identifying and controlling the trigger(s) could be overcome, the pre-emptive approach has a significant flaw: it only prevents the performance of the habit or habit-like behavior; it does nothing to change it. Should the circumstances that allow control over the trigger(s) change, people would likely revert to the habitual or habit-like behavior, because
nothing has been done to inhibit the causal relationship between trigger and habit, *unless* the trigger-habit connection requires regular reinforcement to maintain its strength.

The preceding arguments suggest that the pre-emptive approach to changing habits (i.e., changing habitual and habit-like behavior by preventing exposure to stimuli that trigger such behaviors) is, in most cases, neither practical for demarketing nor particularly desirable. The next section examines a different approach to the habit change problem.

**Decomposing the Habit Change Problem**

Earlier chapters of this dissertation have made a distinction between volitional and habitual behavior. Volitional behavior is the result of conscious choice, while a habit is a pattern of activity that has, through extensive repetition, become automated, fixed, and effortless, and occurs without conscious awareness or consideration of alternatives (Definition 3.1). Although changing volitional behavior is not necessarily easy, it is relatively well understood by social psychologists. The same cannot be said for habitual behavior. Given the remarkable efficiency and flexibility of human cognitive systems, though, it seems unlikely that the two kinds of behavior change are completely separate. Rather, it is probable that there are overlaps between the two. It is therefore proposed here that every successful habit change includes volitional behavior change. (Note that this does not imply that every volitional behavior change is a part of a larger habit change.) It is further proposed that the volitional behavior change portion of the habit change is preceded by a process of *de-automation*, and followed by a process of *consolidation*. The former process brings the habit to conscious awareness and under conscious control, so that volitional behavior change is possible, while the latter process automates the new behavior so that, once again, it can be performed without demanding too many cognitive resources. Once this progression, shown in Figure 8-1, is understood, the habitual behavior change problem, and hence the demarketing problem, becomes more tractable.
Hence, Proposition 8.2:

**Proposition 8.2**
Successful habit change involves three components, which always occur in the same order. First, the individual must become aware of specific occurrences of the habit and bring it under conscious control. Then, volitional behavior change can occur. If the change is to persist, the new behavior must be automated.

**Corollary**
If the new behavior is not automated, it will be extinguished, and the original habit will re-assert itself.

**De-Automation**

Since habits and habit-like behaviors are relatively automated processes that run without awareness or conscious control, the first step in changing such behaviors is to bring them under conscious control (Definition 8.1).

**Definition 8.1**
*De-automation* is the process of bringing under conscious control the automated processes that underlie habit-like behaviors.

Both bringing and keeping the habit under conscious control can be difficult, even under the best of circumstances. Even people who are truly determined to change a habit often find it difficult to do so. And demarketers face an even more difficult task. Lacking control over the people whose behavior they seek to change, demarketers have to persuade them to bring certain of their own habitual and habit-like behaviors under conscious control.

It is proposed below that de-automation requires that people know precisely what behavior(s) to change, that they can reliably anticipate the performance of the behavior(s), and that they have enough motivation to invest the cognitive energy necessary to bring the habit under conscious control.
Before developing those propositions, however, it is necessary to make explicit a key assumption about the relationship between automated processes and habit-like behaviors.

**Automated processes and habit-like behaviors.** As Chapter 3 explained, habits and habit-like behaviors are the results of automated processes. This notion is formalized in Assumption 8.1:

Assumption 8.1
Habits and habit-like behaviors are the results of automated processes.

Consider, for instance, a university student taking notes in class. For most undergraduate students, note-taking is clearly a habit-like behavior. It is likely made up of several automated processes, such as: one to pick out cues that indicate which points are more important, one to organize the notes (e.g., using headings, under which each related point appears on a new line), one to actually do the writing, and one to keep track of what other people in the class are doing, as illustrated in Figure 8-2. None of these automated processes requires attention; the student pays attention to the content of the class.

**Figure 8-2**
Relationship Between Automated Processes and Habit-Like Behaviors

It is also assumed in this research that the automated processes that combine to form a relatively complex habit-like behavior such as note-taking are themselves combinations of lower-level automated processes. For instance, writing is an automated process used in note-taking, but writing itself is made up of several automated processes, such as: one for the formation of each individual
letter, one to connect the letters, one to spell, one to separate letters in one word from letters in another, and so on. Hence Assumption 8.2:

**Assumption 8.2**
The automated processes that combine to form a habit-like behavior are themselves combinations of lower-level automated processes.

It is further assumed that, in the hierarchy of automated processes and habit-like behaviors, a given automated process at one level is not necessarily dedicated to a single automated process or habit-like behavior at a higher level. Returning to the note-taking student, writing is one of the automated processes making up the note-taking habit, but it may also be an automated process making up a different habit, such as writing letters home. Hence Assumption 8.3:

**Assumption 8.3**
Any automated process may be a constituent process in an automated process or habit-like behavior at a higher level of organization.

Expressing Assumption 8.1 to 8.3 graphically, Figure 8-3 illustrates possible relationships among habit-like behaviors and automated processes at various levels of complexity.

**Figure 8-3**
Hierarchy of Automated Processes and Habit-Like Behaviors

<table>
<thead>
<tr>
<th>( \text{ap}_1 )</th>
<th>( \text{ap}_2 )</th>
<th>( \text{ap}_3 )</th>
<th>( \ldots )</th>
<th>( \text{ap}_k )</th>
<th>( \ldots )</th>
<th>( \text{ap}_m )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \text{AP}_1 )</td>
<td>( \text{AP}_2 )</td>
<td>( \text{AP}_3 )</td>
<td>( \ldots )</td>
<td>( \text{AP}_k )</td>
<td>( \ldots )</td>
<td>( \text{AP}_n )</td>
</tr>
<tr>
<td>( \text{H}_1 )</td>
<td>( \text{H}_2 )</td>
<td>( \text{H}_3 )</td>
<td>( \ldots )</td>
<td>( \text{H}_t )</td>
<td>( \ldots )</td>
<td>( \text{H}_z )</td>
</tr>
</tbody>
</table>

**Description.** Given Assumption 8.1, that habit-like behaviors are the results of automated processes, it follows that changing the habit-like behavior requires control over the constituent automated processes. In order to gain control over those processes, it is necessary to know exactly
which processes are involved. For instance, because the note-taking habit is made up of several automated processes, merely telling the student to "take better notes" would be of limited value. The student needs to know what exactly the problem is. Does he or she focus on the wrong points, or is the problem slow writing? Similarly, in a demarketing context, exhortations to "save energy" or even "turn off unnecessary lights" are too vague. There are other, related problems.

In some cases, people may want and intend to change their behavior, but doing so may require changes in specific habits that are so ingrained that they may not even realize that they have them. For instance, the irony of a student newspaper editorial arguing against logging is lost on its authors. They are devoted to using their persuasive skills to saving trees but use a medium that destroys them, even though other options are available.

Alternatively, the behavior change may require changing habits people are aware they have but do not realize are related to the intended behavior change. For instance, someone might know that he or she eats eggs for breakfast every day, but not realize that that habit is inconsistent with reducing dietary fat. It should therefore be a priority for demarketers to describe exactly what habits or habit-like behaviors that they want people to change.

Hence Proposition 8.3:

**Proposition 8.3**
To change a habit-like behavior, an individual needs a specific and detailed description of the habit-like behavior and relevant underlying automated processes. This is a necessary but not sufficient condition for change.

Consider, for instance, a demarketing program designed to reduce energy consumption by persuading people not to use electrical devices unnecessarily. For the program to achieve maximum effectiveness, people need to be told exactly what that means. They need to know what electrical devices the request refers to, what use would be classified as necessary (as opposed to unnecessary), and what specific behaviors (including, where possible, triggers) they should change. Such a demarketing program might, for example, point out that many people walk into their offices and
reflexively turn on the overhead lights even though there is plenty of light from the window. Without an explicit description like this, people who sincerely want to reduce their consumption of energy might not even notice that opportunity, simply because walking into their offices and turning on the lights is an automated process and therefore not subject to conscious awareness. A specific, detailed description of the habit-like behavior and its relevant underlying automated processes can bring them to conscious awareness.

The requirement for a detailed description of the specifics of the habit-like behavior change places a heavy burden on demarketers, as it requires cataloguing the habit-like behavior, including its underlying automated processes and their triggers. Accomplishing this may be complicated because a single habit-like behavior (e.g., turning on a light) can be the result of different automated process (e.g., walking into the room, starting to read something that requires concentration), each triggered by a different stimulus. Communicating the complete catalog of underlying automated processes is likely to be impractical for most demarketers, so typical examples of behavior should be identified and communicated.

Given the preceding discussion, it is not surprising that, in their explication of the habit-reversal method they developed for overcoming nervous habits and tics, Azrin and Nunn (1973) emphasize that the first step is for the client "to describe the details of the movement to the counsellor, using a mirror, if necessary, while [re-enacting] several instances of the typical movement" (Azrin and Nunn 1973: 622). Note that having the client describe the habit to the counsellor ensures that the client really does know what the habit is, and is therefore superior to communication in the other direction, but the latter option is the one most usually available to demarketers.

Reliable anticipation. Another condition for successful de-automation is the ability to reliably anticipate performance of the habit-like behavior that is at issue. Since habit-like behaviors are complexes of automated processes, and automated processes are triggered by certain stimuli, it
should really be necessary only to anticipate the appearance of the triggering stimuli. There is plenty of anecdotal evidence to indicate that anticipation of habitual and habit-like behaviors is often difficult. In trying to break habits, people frequently complain that they have already performed the behavior before they even notice it, such as a dieter who suddenly realizes that he or she is halfway through a chocolate bar. Hence Proposition 8.4:

**Proposition 8.4**
To change a habit-like behavior, an individual needs to be able to reliably anticipate its performance. This is a necessary but not sufficient condition.

**Corollary**
Since a habit-like behavior's underlying automated processes are triggered by certain stimuli, its reliable anticipation amounts to reliable anticipation of the triggering stimuli.

It is therefore important that the description of the habit-like behavior include the triggers. If people are aware that a particular stimulus triggers the habit-like behavior they are trying to change, it may be possible for them to avoid the trigger, and thereby prevent the performance of the habit-like behavior. For instance, if the trigger to turning up the thermostat is feeling cold, then wearing warmer clothes may prevent unnecessary consumption of energy.

As well, situations in which the trigger is likely to arise should be described, so that, if possible, they can be avoided. For instance, if mid-afternoon hunger pangs are the trigger for someone to eat a chocolate bar at work, then eating a larger lunch or bringing a healthier snack to eat before the hunger pangs usually arise may prevent the hunger pangs that trigger the consumption of an unnecessary chocolate bar.

Azrin and Nunn (1973), in their habit-reversal procedure, recommend that people trying to overcome nervous habits and tics be given practice in detecting the earliest sign of a habit movement, and that they learn to become aware of situations in which the habit is likely to occur by having the person "recall all situations, persons, and places where the habit was likely to occur and having him describe how the habit was performed in each of those situations" (Azrin and Nunn 1973: 623).
Motivation. Both P&D (e.g., Prochaska and DiClemente 1984) and Azrin and Nunn (1973) emphasize the importance of motivation in changing habitual and habit-like behavior. Change is, according to these researchers’ experience, unlikely to occur unless there is considerably more than a casual interest in the change. However, neither team of researchers provides an explanation for their conclusion.

From the cognitive point of view adopted in this dissertation research, the need for motivation can be explained as a result of scarcity of cognitive resources. Kahneman (1973) points out that humans have limited processing capacity. When there is competition for processing capacity, it is likely that if something can run automatically, it will, because automatic processing does not use attentional capacity, so attention can be directed elsewhere. The tendency to use automated processes can be overridden — if the motivation to override automation is great enough. Hence Proposition 8.5:

**Proposition 8.5**
To change a habit-like behavior, an individual must have enough motivation to override the underlying automated processes. This is a necessary but not sufficient condition.

Motivation to override the underlying automated processes would occur if the person becomes convinced that the problem has personal relevance (Janis and Mann 1977, Ronis, Yates and Kirscht 1989). This could be done either by increasing the importance of the advantages associated with changing the habit-like behavior or increasing the importance of the disadvantages associated with not changing the habit-like behavior. Depending on the degree of automation, it may be enough to draw attention to the problem, and make suggestions for behavior change; or it may be necessary to manipulate the consequences of the habit-like behavior so that they are intense enough to attract attention. In the domain of energy conservation, for example, purchasing behavior is likely to be less automated than actual consumption behavior: it is easier to get people to pay attention to what kind of light bulb they are buying than to how often they switch it on and off.
In summary, then, de-automation is the first step in changing habitual and habit-like behavior. Since such behavior is a complex of automated processes, it can be difficult to overcome. A cognitive analysis of the problem suggests that people need a specific and detailed description of the habit-like behavior and its underlying automated processes, including the triggering stimuli, and they need to be able to anticipate when such triggers are likely to occur. Finally, they need to be motivated to make the effort to overcome the automation so that volitional behavior change can occur.

Volitional Behavior Change: The Fishbein and Ajzen Approach

Once de-automation has been achieved, and the relevant behaviors are under conscious control, then the problem of changing habit-like behavior reverts to the traditional behavior change problem that social psychologists have been working on for years.

Although various credible volitional behavior change theories exist, the Fishbein and Ajzen (1975) Theory of Reasoned Action is one of the more widely accepted. This theory posits that behavior \( B \) is determined by a person's intention to perform it \( I \), and the more specific the intention, the more likely it is to be an accurate predictor of behavior.

Intentions are, in turn, determined by the person's attitudes (i.e., general feeling of favorableness or unfavorableness) toward the behavior \( A_b \), as well as by the associated subjective norm (i.e., the person's perception that people important to him or her think he or she should or should not perform the behavior in question) \( SN \). The relative importance of the individual's attitude and subjective norm (\( w_1 \) and \( w_2 \) respectively) may vary across behaviors and individuals\(^2\).

Expressed mathematically, the theory at this level is:

\[
B \sim I = (A_b)w_1 + (SN)w_2
\]

\(^2\)\( w_1 \) and \( w_2 \) are empirically determined, and may be influenced by variations in behavior, object, situation, and time, as well as by individual difference variables. Their relative influence may also be affected by behavior change strategies.
Both the attitude and the subjective norm components of the theory can be further analyzed. A person's attitude toward the behavior is determined by his or her salient beliefs about it, and can be estimated by summing the products of the individual's evaluation of each of the behavior's consequences \((e_i)\) and the strength of his or her belief that performing the behavior will lead to that consequence \((b_i)\):

\[
A_b = \Sigma_i b_i e_i
\]

The relative influence of each belief will be determined by one's evaluations of each of those consequences.

Similarly, the subjective norm is determined by the perceived expectations of specific referent individuals or groups \((b_j)\) and by the person's motivation to comply with those expectations \((m_j)\):

\[
SN = \Sigma_j b_j m_j
\]

According to the Fishbein and Ajzen theory, any attempt to induce behavior change must always be directed at one or more of the individual's beliefs. Beliefs can be influenced two ways, by active participation and by persuasive communications. In active participation, a person is placed in a situation where he or she can personally observe that a behavior has a particular consequence. Assuming that the person actually perceives the behavior-consequence association, this is a powerful behavior change strategy, as people rarely doubt information received through their own senses (i.e., \(e_i\) will be high). Unfortunately, it is frequently impractical to arrange for people to experience or observe personally the behavior-consequence relationship. In such cases, persuasive communications can be used — the person is told that the behavior in question has a particular consequence. With persuasive communications, the major problem is to ensure that the person believes the communication linking the behavior and the consequence (i.e., the danger is that \(e_i\) will be low).
**The Theory of Reasoned Action in a Demarketing Context**

The kind of behavior change sought in demarketing, reduction in excessive discretionary consumption, can be difficult to get, even when de-automation has been successful. Part of the reason is that the behavior change process is complex, with many intervening processes, each of which is likely to dilute the potential effect. As Figure 8-4 shows, changes in beliefs affect attitudes and/or subjective norms, which, in turn, affect behavioral intentions. Finally, behavioral intentions influence behavior. The effect of a change in any given belief is therefore likely to be small.

**Figure 8-4**
Overview of the Theory of Reasoned Action

```
BELIEFS → ATTITUDES AND SUBJECTIVE NORMS → INTENTIONS → BEHAVIOR
```

Another part of the reason for the difficulty in getting reductions in consumption is that demarketing asks people to give up something desirable for a set of benefits that are not well-defined, as outlined in Table 3-1. Consequently, demarketing strategies have to rely mostly on persuasive communications, which are generally less effective than the alternative, active participation.

In spite of these obstacles, though, many people do decide to try to consume less: they go on diets, they cut down on passive diversions like television viewing, they turn down the thermostat, they decline to take a bag when they make a purchase. If this were a typical marketing problem, such progress might be perceived as success, and rightly so. Often the biggest problem in conventional marketing situations is to convince potential users to try the product; once they have sampled it, they are likely to continue using it, because most products satisfy some immediate need. In the case of demarketing, however, sampling the "product" is not likely to induce repeated use, because the benefits are not immediately evident, and because of the habit-like nature of the consumption behavior.

Recall that the reason for automation in cognitive and other processes is that cognitive resources are limited and automation permits processes to run in parallel, rather than serially. This
capacity constraint remains. It is therefore unlikely that adequate resources will be consistently available to permit the "reasoned action" proposed by volitional behavior theories, particularly when the benefits of behavior change are unclear, as they often are in demarketing situations. Consequently, in instances when there is competition for controlled processing capacity, there is likely to be reversion to the habit-like behavior. People go off their diets, they gradually resume their usual television viewing habits, they forget to turn down the thermostat, and they don’t notice until it is too late that they have been given an unnecessary bag with their purchase.

Since it is clearly impractical to expect that people will be willing or able to make a conscious decision to consume less every time there is an opportunity to do so, the new behavior must be automated and the old habit extinguished. In other words, the bad habit must be replaced with a good habit.

Consolidation

The final step in changing habit-like behaviors is to consolidate the new behavior so that it becomes habit-like. Automating the new behavior may be where demarketing has tended to fall apart. Marketing programs are generally good at getting people to try to consume less — they go on diets, they watch less television, they turn off lights — but somehow, in many people, these behavior changes never seem to get beyond the novelty stage. If the new behavior is not consolidated (see Definition 8.2), the gains achieved in de-automation and volitional behavior change are quickly extinguished.

Definition 8.2

*Consolidation* involves repetition of the new behavior until it has become so well-practised (i.e., automated) that there is no advantage in terms of cognitive resource use to reverting to the old habitual behavior.

In order to foster consolidation, demarketers must provide people with both the motivation and the means to engage in volitional behavior change many times, preferably in a variety of settings.
In other words, they have to make it worth people's while to override their natural inclination to consume excessively, until the new style of consumption is habit-like, at which time it will not require attention, or conscious awareness, and, once triggered, will run to completion.

The process of consolidation will be affected not only by repetition itself, but by the information generated by each repetition of the act. This information will affect the belief structure that ultimately drives the volitional behavior. For instance, as a dieter becomes accustomed to eating less, hunger pangs may subside, so the belief that eating less causes discomfort will be changed. Conversely, if someone carefully turns off unnecessary lights but sees only a minimal change in the electric bill, then his or her beliefs about the economic value of energy conservation will be changed negatively. Demarketers must therefore, where possible, ensure that when people make the effort to consume less, their belief structure is altered in a way that makes future volitional acts more likely.

Only when the new pattern of behavior has become habit-like and the old pattern of behavior has been extinguished can the habitual behavior change be said to be complete. Each of the three components of habitual behavior change, de-automation, volitional behavior change, and consolidation — must operate for effective demarketing.

Relationships Among the Components of Habitual Behavior Change

The three components of habitual behavior change operate consecutively, but also iteratively. Cognitive resources are sufficiently scarce and the environment sufficiently complex and challenging that it is almost certain that people will revert occasionally or frequently to the old behavior patterns, despite their best intentions. In situations where there is competition for processing resources, anything that can be processed in parallel using minimal resources will be. Thus it is the rule rather than the exception to observe lapses among people seeking to reduce their consumption. They go off their diets, and sometimes they just forget that they intended to insist on less packaging.
An Additional Complication

In addition to the challenges inherent in each of the component processes, there is another potential complication. Since the habitual behavior change process is actually a sequence of three distinct components, operating differently, to different purposes, it is not inconceivable that they may sometimes act to counterpurposes. In other words, the same item of persuasive content may work well for people in one component, but may actually be detrimental if used for people in another component. For instance, dramatic information may be useful in de-automation and even volitional behavior change, because it attracts attention, but when consolidation is happening, dramatic new information, even if it is supportive, is disruptive. An example of this complication sometimes occurs in weight loss. Some people lose a lot of weight quickly when they go on an extreme diet, such as a liquid diet, but that kind of weight loss and that style of eating are not maintainable for long. Many of these people then regain the lost weight because they have no maintainable skills to consolidate.

Summary

This chapter began with a brief review of the psychology literature related to habit change that revealed that, while there are programs applicable to various specific habits or habit-like behaviors, there have been few attempts to gain a more general understanding of the underlying processes. The chapter then turned to developing theory on changing habits and habit-like behaviors, based on what is known about the nature of habits and habit-like behavior (reviewed in Chapter 3). It was proposed that changing habit-like behavior proceeds in three steps: de-automation, volitional behavior change, and consolidation. Explanations from a cognitive psychology point of view were offered for each component of the proposed habit-change process.

The next chapter presents the hypotheses and design of a study that tests some of the theoretical concepts proposed here.
CHAPTER 9
STUDY 2: HYPOTHESES AND DESIGN

The thesis of this dissertation is that demarketing is not just a variation on the usual marketing problem, but a problem that is (1) more complex than the typical marketing problem, and (2) similar to the habit change problems studied in clinical psychology. In other words, marketing is like asking consumers to develop new, "good" habits; while demarketing is like asking consumers to change existing "bad" habits; and changing a bad habit is more difficult to do than developing a good habit.

Chapter 8 proposed that habit change proceeds in three steps: de-automation of the old habit-like behavior, volitional change of that behavior, and consolidation of the new behavior. This chapter develops hypotheses and describes the design of a study that allows two approaches to demarketing excessive discretionary consumption — i.e., wasteful behavior — to compete directly. The first approach is a persuasion-based "traditional marketing" approach, and the second is a behavior-based "habit change" approach, as proposed in Chapter 8. Each is tested in two situations: when the wasteful behavior is new; and when the wasteful behavior is well-entrenched, and has become habit-like. It is expected that if the wasteful consumption behavior and/or the consumption situation is relatively new (i.e., not yet habit-like), then persuasion-based behavior change strategies will work just as well as behavior-based change strategies. However, if the wasteful consumption behavior and/or the consumption situation has become habit-like, then persuasion-based strategies will not
achieve reductions in consumption; behavior-based strategies will be more effective, though they may be subject to decay.

Hypotheses

The hypotheses are stated here in general terms; operational versions of the hypotheses are presented after the study has been described in more detail.

There are three sets of hypotheses. The first set (1A, 1B, and 1C) concerns behavior change when a behavior has not been repeated extensively enough to be considered habit-like. Under these circumstances, both persuasion-based and habit-based strategies should be effective in changing behavior (1A and 1B). However, the reinforcement provided by the behavioral reinforcement in the persuasion-plus-behavior should be more effective in sustaining behavior change (1C). These hypotheses are not the central concern of the dissertation. They merely reiterate the predictions of the Theory of Reasoned Action (1A) and those of learning theory (1B and 1C). They are presented to demonstrate that the experimental procedure produces expected results for volitional behavior (i.e., behavior that is the result of a conscious decision), so that the results produced by the same procedure for habit-like behavior can be attributed solely to the difference between the two types of behavior.

The following hypotheses assume that there is an undesirable current behavior and a desirable alternative behavior that accomplishes the same terminal goal for the consumer (where resource use is instrumental to that terminal goal). Then:

**Hypothesis 1A**

If the undesirable behavior has not been extensively repeated (i.e., has not become habit-like), then a persuasive message that produces (or activates) a (more) positive attitude toward the desirable behavior will induce the desirable behavior in the post-manipulation period.
Hypothesis 1B
If the undesirable behavior has not been extensively repeated (i.e., has not become habit-like), then a manipulation that both induces (or activates) a (more) positive attitude toward the desirable behavior and reinforces the positive attitude through limited practice of the desirable behavior will induce the desirable behavior in the post-manipulation period.

Hypothesis 1C
If the undesirable behavior has not been extensively repeated (i.e., has not become habit-like), then as experience with the situation accumulates, the behavior change induced by a manipulation that both induces (or activates) a (more) positive attitude toward the desirable behavior and reinforces the positive attitude through limited practice of the desirable behavior will be sustained better than the behavior change induced by a persuasive message that produces (or activates) a (more) positive attitude toward the desirable behavior.

In other words, if the consumption behavior and/or the consumption situation is relatively new, consumption is still volitional, so in the period immediately following the manipulation, traditional behavior change strategies based on persuasion to change attitudes should work (1A) just as well as behavior change strategies based on habit change strategies (1B). Repeated post-manipulation exposure to the situation should generate habit-like behavior, so the habit-based strategies are predicted to have a superior effect.

The second set of hypotheses (2A, 2B, 2C, and 2D) concerns behavior change when a behavior has been repeated extensively enough to be considered habit-like. When consumption has become habit-like, merely using a persuasive message to change attitudes should be relatively ineffective (2A), since the theory driving such strategies assumes volitional behavior. In contrast, reinforcing positive attitudes with limited practice (the habit-based strategy) should be effective in achieving behavior change (2B), although interference from the habit-like undesirable behavior is likely to cause some decay in the incidence of the desirable behavior (2C). However, even taking into account this decay, the habit-based strategy should be more effective than the attitude-only strategy (2D). These hypotheses are the central concern of the study.
As with the first set, this second set of hypotheses assumes that there is an undesirable current behavior and a desirable alternative behavior that accomplishes the same terminal goal for the consumer (where resource use is instrumental to that terminal goal). Then:

**Hypothesis 2A**
If the undesirable behavior has been extensively repeated (i.e., has become habit-like), then a persuasive message that produces (or activates) a (more) positive attitude toward the desirable behavior will not induce the desirable behavior in the post-manipulation period.

**Hypothesis 2B**
If the undesirable behavior has been extensively repeated (i.e., has become habit-like), then a manipulation that both induces (or activates) a (more) positive attitude toward the desirable behavior and reinforces the positive attitude through limited practice of the desirable behavior will induce the desirable behavior in the post-manipulation period.

**Hypothesis 2C**
If the undesirable behavior has been extensively repeated (i.e., has become habit-like), then as experience with the situation accumulates, behavior change induced by a manipulation that both induces (or activates) a (more) positive attitude toward the desirable behavior and reinforces the positive attitude through limited practice of the desirable behavior will exhibit some decay.

**Hypothesis 2D**
If the undesirable behavior has been extensively repeated (i.e., has become habit-like), then as experience with the situation accumulates, behavior change induced by a manipulation that both induces (or activates) a (more) positive attitude toward the desirable behavior and reinforces the positive attitude through limited practice of the desirable behavior will be greater than behavior change (if any) following a manipulation that produces (or activates) a (more) positive attitude toward the desirable behavior.

In other words, once consumption has become "habitually" excessive, persuasion-based strategies will not achieve reductions in consumption. Instead, strategies that are based on habit-change should be more effective, though they may be subject to decay.

The third set of hypotheses concerns the relative effectiveness of a persuasive message alone (the traditional marketing approach) and the persuasive message reinforced by limited practice of the
desirable behavior (the habit-change approach) depending on whether the undesirable behavior had been practised enough to become habit-like.

If the undesirable behavior has been practised so much that it has become habit-like, then changing that behavior should require more than just a persuasive message; behavioral reinforcement should also be necessary (3A). On the other hand, if the undesirable behavior has not been practised enough to have become habit-like, then a persuasive message alone should be enough to effect behavior change. Reinforcing the persuasive message with behavior would be unnecessary overkill (3B).

Again, this third set of hypotheses assumes that there is an undesirable current behavior and a desirable alternative behavior that accomplishes the same terminal goal for the consumer (where resource use is instrumental to that terminal goal). Then:

**Hypothesis 3A**
A manipulation that merely induces (or activates) a (more) positive attitude toward the desirable behavior will be less effective if the undesirable behavior has been extensively repeated (i.e., has become habit-like) than if the undesirable behavior has not been extensively repeated.

**Hypothesis 3B**
A manipulation that both induces positive attitudes toward the desirable behavior and reinforces that behavior with limited practice will be equally effective whether or not the undesirable behavior has been extensively repeated (i.e., has become habit-like).

**Methodological Approach**

The survey in Study 1 had given some indication that a habit-based model, the Revolving Model of Behavior Change, provides a reasonable description of changes that occur in a consumption situation typical of those demarketing programs seek to change, energy conservation. Exploring further the connection between demarketing and habit-like behavior called for a more controlled study. The data for this study were therefore collected in a laboratory experiment. The experimental
situation was designed to simulate the critical aspects of demarketing problems, while controlling, as much as possible, for the effects of other variables, thereby increasing internal validity.

To summarize briefly, participants were asked to complete a task requiring the use of a resource. Their attention was focused on the task; the resource was just a means to an end. Their initial resource use was measured. Then the manipulations were delivered. Participants were exposed either to a persuasive message urging them to reduce their consumption of the resource (the traditional marketing approach) or to the same persuasive message reinforced with limited practice of the desired conservation behavior (the habit-change approach). Participants’ post-manipulation consumption of the resource was measured.

Criteria for the Target Behavior

Participants in the experiment were led to believe that they were involved in a study on how the organization of requests for information affects memory for that information. The actual variable of interest, however, was their consumption of paper in the completion of the memory task. This consumption behavior possesses many of the key characteristics of behaviors that are the focus of demarketing problems.

First, in many discretionary consumption situations, people become accustomed to using the resource wastefully. While there may originally have been good reasons for using the resources wastefully, those good reasons have become obsolete (at least from the demarketer’s point of view). In this experiment, participants quickly became used to using only one side of the paper, rather than both sides.

Second, in many discretionary consumption situations, the resource is not of central concern to the participant; it is merely a means to an end. In fact, it may be taken completely for granted. For example, most people do not think about how much energy they are using when they turn up their thermostats a few degrees; they just want to get warm. In this experiment, a cover story was
used to lead participants to believe that they were involved in a study of how the organization of requests for information affects memory for that information; the paper was just a resource they needed to complete the tasks assigned.

Third, in many discretionary consumption situations, changing the behavior is costly, though not necessarily in financial terms. For example, keeping the house a few degrees cooler than usual is not as comfortable. In this experiment, participants were under some time pressure, they were instructed to keep their work organized chronologically, and they knew that they would have to be able to locate specific lists quickly; this was not as easy to do when two sides of the paper are used instead of one.

Fourth, in many discretionary consumption situations, changing the behavior often has uncertain returns that will accrue far in the future, frequently to people other than those making the effort. For example, keeping the house a few degrees cooler means that people are uncomfortable now so that their descendants may be less uncomfortable in the future. In this experiment, there was no clear benefit (with respect to the task being performed) to using two sides of the paper, other than it was the "right" thing to do.

Finally, in many discretionary consumption situations, the reasons for changing the behavior are not immediately evident. For example, there are so many rivers in B.C. that could accommodate hydroelectric dams that many people have trouble believing that there is any need for British Columbians to conserve electricity. In this experiment, there was plenty of paper in full view; it was clear that there was no immediate danger of running out. The only reason participants would conserve paper is because it is the "right" thing to do.

Overview of the Procedure

After an introductory videotape that set up the cover story, the experiment proceeded in six steps: first, participants completed an initial set of lists; then, manipulations were delivered; after
that, there was a distraction; this was followed by the completion of another set of lists; a questionnaire was then filled out. Finally, participants were thoroughly debriefed by mail.

**Pre-manipulation lists.** In an initial set of trials (either a short set or a long set), participants made lists of items in various categories (e.g., countries in South America). They were instructed to put the number of the list in the upper left hand corner of the page and to keep the lists in order. After the lists were completed, participants were asked to place specific lists on the top of their pile of lists.

**Manipulations.** Within a videotaped lecture on network models of memory, participants received either a persuasive manipulation, a persuasion plus behavior manipulation, or no manipulation (Control).

**Distraction.** Participants were shown an interesting 10 minute videotape (an award-winning humorous cartoon documentary on home safety).

**Post-manipulation lists.** Participants were be asked to make lists of items in 30 categories. Again, they were instructed to put the number of the list in the upper left hand corner of the page and keep the lists in order. After the lists were completed, participants were asked to count the number of items in certain specific lists and record the count in the bottom left hand corner of the page on which the list appeared.

**Questionnaire.** Participants filled out a short questionnaire containing demographic and attitudinal information.

**Debriefing.** Participants were thoroughly debriefed in writing. Special attention was given to explaining the deception and why it was judged to be necessary.

**Design**

The design was simple. As Table 9-1 shows, each participant was to be randomly assigned to one of the six groups. Participants would receive either little premanipulation practice of making
one-sides lists (five lists) or extensive premanipulation practice (30 lists). Their base rate of resource use could thereby be measured. The manipulations were then delivered. A distraction was then provided, after which participants continued to make lists. Their post-manipulation rates of resource use could then be measured.

Table 10-1
Experimental Procedure and Design

<table>
<thead>
<tr>
<th>Little Pre-Manipulation Repetition of the Undesirable Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control</strong></td>
</tr>
<tr>
<td><strong>Persuasion</strong></td>
</tr>
<tr>
<td><strong>Persuasion + Behavior</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Extensive Pre-Manipulation Repetition of the Undesirable Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control</strong></td>
</tr>
<tr>
<td><strong>Persuasion</strong></td>
</tr>
<tr>
<td><strong>Persuasion + Behavior</strong></td>
</tr>
</tbody>
</table>

The dependent variables concerned how successful the various manipulations were at inducing participants to use both sides of the paper.

**Operational Hypotheses.** Recall that the first set of hypotheses concerns the Little Pre-Manipulation Practice of the Undesirable Behavior groups. It was assumed that before the manipulations, all three treatment groups (Persuasion + Behavior, Persuasion, and Control) would be doing the tasks using only one side of the paper. Confirming this assumption required:

\[ A₁a: \quad O₁ = O₄ = O₇ = 0 \]

\[ R \text{ refers to the randomization procedure;} \]
\[ U_k \text{ refers to the amount of pre-manipulation practice of the undesirable behavior:} \]
\[ k = 1 \text{ for little premanipulation practice (five lists),} \]
\[ k = 2 \text{ for extensive premanipulation practice (30 lists);} \]
\[ P \text{ refers to the persuasive manipulation;} \]
\[ B \text{ refers to the behavioral reinforcement of the persuasive manipulation;} \]
\[ Oₙ \text{ refers to the } n\text{th observation of the dependent variable;} \]
\[ Q \text{ refers to the administration of the questionnaire (attitude and demographic data).} \]
Moreover, it was assumed that the task itself did not induce the desirable behavior. Confirming this assumption required:

\[ A1b: \quad O_7 = O_8 = O_9 = 0 \]

Recall Hypothesis 1A:

**Hypothesis 1A**
If the undesirable behavior has not been extensively repeated (i.e., has not become habit-like), then a persuasive message that produces (or activates) a (more) positive attitude toward the desirable behavior will induce the desirable behavior in the post-manipulation period.

The operational statement of this hypothesis is:

\[ H1a: \quad O_3 > O_2 \text{ and } O_2 = 0 \]

Recall Hypothesis 1B:

**Hypothesis 1B**
If the undesirable behavior has not been extensively repeated (i.e., has not become habit-like), then a manipulation that both induces (or activates) a (more) positive attitude toward the desirable behavior and reinforces the positive attitude through limited practice of the desirable behavior will induce the desirable behavior in the post-manipulation period.

The operational statement of this hypothesis is:

\[ H1b: \quad O_8 > O_2 \text{ and } O_2 = 0 \]

A stronger statement of \( H1b \) is:

\[ O_2 = O_3 \]

This states that attitude-based and habit-based strategies are equally effective in changing volitional behaviors.

Recall Hypothesis 1C:
**Hypothesis 1C**
If the undesirable behavior has not been extensively repeated (i.e., has not become habit-like), then as experience with the situation accumulates, the behavior change induced by a manipulation that both induces (or activates) a (more) positive attitude toward the desirable behavior and reinforces the positive attitude through limited practice of the desirable behavior will be sustained better than the behavior change induced by a persuasive message that produces (or activates) a (more) positive attitude toward the desirable behavior.

The operational statement of this hypothesis is:

\[ H_{1c}: O_3 > O_6 \]

The second set of hypotheses concerns the High Pre-Manipulation Practice of the Undesirable Behavior groups. As with the first set of hypotheses, it was assumed that before manipulations, all three treatment groups (Persuasion + Behavior, Persuasion, and Control) would be doing the tasks using only one side of the paper. Confirming this assumption requires:

\[ A_{2a}: O_{10} = O_{13} = O_{16} = 0 \]

Moreover, it was assumed that the task itself did not induce the desirable behavior. Confirming this assumption requires:

\[ A_{2b}: O_{16} = O_{17} = O_{18} = 0 \]

Recall Hypothesis 2A:

**Hypothesis 2A**
If the undesirable behavior has been extensively repeated (i.e., has become habit-like), then a persuasive message that produces (or activates) a (more) positive attitude toward the desirable behavior will not induce the desirable behavior in the post-manipulation period.

The operational statement of this hypothesis is:

\[ H_{2a}: O_{14} = O_{15} = 0 \]

Recall Hypothesis 2B:
Hypothesis 2B
If the undesirable behavior has been extensively repeated (i.e., has become habit-like), then a manipulation that both induces (or activates) a (more) positive attitude toward the desirable behavior and reinforces the positive attitude through limited practice of the desirable behavior will induce the desirable behavior in the post-manipulation period.

The operational statement of this hypothesis is:

\[ H_{2b}: \ O_{11} > 0 \]

Recall Hypothesis 2C:

Hypothesis 2C
If the undesirable behavior has been extensively repeated (i.e., has become habit-like), then as experience with the situation accumulates, behavior change induced by a manipulation that both induces (or activates) a (more) positive attitude toward the desirable behavior and reinforces the positive attitude through limited practice of the desirable behavior will exhibit some decay.

The operational statement of this hypothesis is:

\[ H_{2c}: \ O_{11} > O_{12} \]

Recall Hypothesis 2D:

Hypothesis 2D
If the undesirable behavior has been extensively repeated (i.e., has become habit-like), then as experience with the situation accumulates, behavior change induced by a manipulation that both induces (or activates) a (more) positive attitude toward the desirable behavior and reinforces the positive attitude through limited practice of the desirable behavior will be greater than behavior change (if any) following a manipulation that produces (or activates) a (more) positive attitude toward the desirable behavior.

The operational statement of this hypothesis is:

\[ H_{2d}: \ O_{12} > O_{15} \]

The third set of hypotheses concerned the relative effectiveness of persuasion alone versus persuasion with behavioral reinforcement depending on whether the undesirable behavior had been extensively practised.
Recall Hypothesis 3A:

**Hypothesis 3A**
A manipulation that merely induces positive attitudes toward the desirable behavior will be less effective if the undesirable behavior has been extensively repeated (i.e., has become habit-like) than if the undesirable behavior has not been extensively repeated.

The operational statement of this hypothesis is:

\[ H3a: \ O_{14} < O_5 \]

Recall Hypothesis 3B:

**Hypothesis 3B**
A manipulation that both induces positive attitudes toward the desirable behavior and reinforces that behavior with limited practice will be equally effective whether or not the undesirable behavior has been extensively repeated (i.e., has become habit-like).

The operational statement of this hypothesis is:

\[ H3b: \ O_4 = O_{17} \]

**Pretests**

Several pretests were done. Pretest 1 \((n = 5)\) confirmed that there was not an existing tendency to use both sides of the paper for the experimental lists. Pretest 1 participants made 20 lists without receiving any instructions on whether to use one or both sides. All Pretest 1 participants used one side of the paper.

Pretests 2 through 6 (total \(n = 26\)) were used to make sure the procedure ran smoothly. Several minor changes in procedure resulted.

**Procedure**

**Randomization.** The experiment was run in groups. Random assignment of participants to groups was achieved by listing the participants (who had signed up in advance) in alphabetical order, by surname and secondarily by given name(s), then assigning the first participant on the list to the
first group, the second to the second group, and so on through the groups until each participant has been assigned to a group.

**Preliminaries.** Each group met in a different room and all groups ran simultaneously. Participants in the Persuasion + Behavior groups each received an information sheet (see Appendix 2), a consent form (see Appendix 2), and four manila envelopes, clearly labelled 1, 2, 3, and 4. Participants in the Persuasion and Control groups each received an information sheet (see Appendix 2), a consent form (see Appendix 2), and three manila envelopes, clearly labelled 1, 2, and 3. In addition, each participant was supplied with a large pad of 3”x5” paper and a pen. Plenty of spare pads were available and prominently displayed at the front of the room (on the administrator’s desk).

At the beginning of the session, the administrator read through the information sheet with the participants and then asked the participants to sign the consent form. After the participants had a chance to do so, the administrator collected the signed consent forms.

After all the signed consent forms were collected, the administrator distributed the instruction sheet (see Appendix 2), and then read through it with the participants, who then had an opportunity to ask questions about the instructions before beginning the task.

**Pre-manipulation lists.** The administrator read out a randomly-ordered list of categories, numbered consecutively, at the rate of one every 30 seconds (see Appendix 2). As the administrator read each category, he/she projected it on a screen. (The list of categories were printed on overhead transparencies, and sequentially revealed as they were read.) Participants wrote the number of the category in the upper left hand corner of each page, and then listed items that fit into the category. The Little Pre-manipulation Repetition groups completed five lists (2.5 minutes); the Extensive Pre-manipulation Repetition groups did 30 lists (15 minutes). After every 10 lists, the administrator instructed participants to count the number of items in certain specific lists of that ten (e.g., 1, 6, 8) and record the number of items in the bottom left hand corner of the page on which the list appeared. (The purpose of this was to increase the perceived cost of changing to making lists on both sides of
the paper.) After all the lists had been completed, the administrator instructed participants insert the lists into envelope 1.

**Manipulations.** The manipulations were delivered via videotape. The script, with variations indicated for each condition, appears in Appendix 2. The videotapes were all made from a single master. Since the Persuasion + Behavior manipulation uses more words than the Persuasion manipulation, which itself uses more words than the Control, the Persuasion + Behavior version was taped as the master; appropriate deletions were made for the other two versions.

Participants watched the video. Participants in the Persuasion + Behavior groups also made 15 lists during the showing of the video, on paper on which the category names had been preprinted on both sides of the paper (i.e., Persuasion + Behavior participants made 15 lists during the video, using both sides of the paper). Persuasion + Behavior participants then inserted the 15 lists they had made during the showing of the video into envelope 2.

**Distraction.** To minimize the carryover of rote behavior and to determine whether the Persuasion and Persuasion + Behavior manipulations had been internalized enough to persist over a short interval, a distraction was provided. Participants watched a 10 minute award-winning, humorous animated documentary on an unrelated topic (household safety).

**Post-manipulation lists.** The administrator again read out categories at the rate of one every 30 seconds. In order to maintain consistency with the cover story, each post-manipulation category had some connection with the one before. See Appendix 2 for the list of post-manipulation categories. All participants made a total of 30 lists (15 minutes). Again, after every 10 lists, the administrator instructed participants to count and record the number of items in certain specific lists of that ten (e.g., 1, 6, 8). After all the lists were completed, the administrator instructed participants to all the lists into the envelope (envelope 3 for the Persuasion + Behavior participants, and envelope 2 for the Persuasion and Control participants).
Questionnaire. The administrator asked participants to complete the questionnaire (see Appendix 2), put it into the remaining envelope when they were finished.

Release. Participants were thanked for their participation and paid by the administrator.

Debriefing. Participants were thoroughly debriefed in a package mailed to their residences. The "process debriefing" technique was used, in which the experimental procedures are explained to participants thoroughly, including reasons for any deception.

Manipulations

It was important that the manipulations not be perceived by the participants as instructions that would carry over to the post-manipulation part of the session. All manipulations were be delivered during the videotaped lecture. The lecture used 15 categories to explain how the network model of memory might work in the present situation. The first category was "Zoo animals;" the second, "Endangered species" and the third, "Environmental problems."

Persuasion + Behavior Manipulation. Participants were instructed to open envelope 3, in which they found 8 sheets of paper, with the 15 categories preprinted with one category on each side of each sheet. The person appearing in the video instructed participants to make the lists referred to. On the third category, the demonstrator said, "That reminds me . . . We use a lot of paper in this study, since we have to have each list on a separate page. If you use both sides of the paper, that would save some paper and some trees. Whether you use one side or two makes no difference to the study, but it would be good for the environment."

Persuasion Manipulation. Participants watched the video, but did not make lists. On the third category, the demonstrator said, "That reminds me . . . We use a lot of paper in this study, since we have to have each list on a separate page. If you use both sides of the paper, that would save some paper and some trees. Whether you use one side or two makes no difference to the study, but it would be good for the environment."
Control. Participants watched the video, but the person appearing in the video neither instructed participants to make lists, nor did she say anything about the use of paper in this study.

Sample

Student participants were recruited from the Faculty of Business at Memorial University of Newfoundland. The experimenter visited class meetings for required courses in all classes, inviting participation and handing around signup sheets. Reminder posters were put up the day before and the day of the experiment.

Participation was voluntary and occurred outside of class time, during a university-wide no-class period. Each participant was paid $5.00 per hour. Participation was anonymous and confidential, in the sense that there was no way to match the data with the individual supplying it.

A total of approximately 175 students signed up to participate in the experiment. Based on experience with pretests, a 25 to 30 percent dropoff rate was expected. In fact, 117 (67%) of the students who signed up to participate actually presented themselves at the appointed place and time.
Recall that in Study 2, each participant was randomly assigned to either a control group or one of four treatment groups. Participants practised a task (making lists) either a little (five lists) or extensively (30 lists), using a resource (paper) wastefully (by using only one side). Participants were led to believe that the variable of interest was how long and interesting their lists were. Then participants saw a videotape concerning the task, in which the manipulations were inserted for the four treatment groups. Treatment participants were encouraged, either in a persuasive message, or in a persuasive message that was reinforced through limited practice, to complete the task using less of the resource (by using both sides of the paper rather than just one side). Participants then continued with the task (for 30 more lists).

Each participant’s resource use was observed at three points during the experiment: once after the initial set of practice trials; and twice after the manipulations, once immediately following the manipulation (the first ten lists post-manipulation) and once after some time had elapsed (the final ten of 30 lists post-manipulation). The dependent variable was the number of times participants used both sides of the paper in the set of lists being observed.

The procedure and design are represented symbolically in Table 10-1:
Table 10-1
Experimental Procedure and Design\textsuperscript{14}

<table>
<thead>
<tr>
<th>Little Pre-Manipulation Repetition of the Undesirable Behavior</th>
<th>Control</th>
<th>Persuasion</th>
<th>Persuasion + Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>U_1</td>
<td>O_1</td>
<td>O_2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P</td>
<td>O_3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>Q</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Extensive Pre-Manipulation Repetition of the Undesirable Behavior</th>
<th>Control</th>
<th>Persuasion</th>
<th>Persuasion + Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>U_2</td>
<td>O_10</td>
<td>O_11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P</td>
<td>O_14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>O_17</td>
</tr>
</tbody>
</table>

Since the dependent variable was the number of times participants used both sides of the paper in the set of lists being observed, $O_1$ reports, for each participant, the number of pieces of paper with lists on both sides, for a given set of trials. For instance, $O_1$ reports, for the five initial practice lists, the number of pieces of paper with lists on both sides. If a participant used only one side of the paper, then there would be no pieces of paper with lists on both sides, and the value of $O_1$ would be 0. If, however, the participant had consistently used both sides of the paper, then there would be two pieces of paper with lists on both sides, and one piece of paper with a list on one side, and the value of $O_1$ would be 2. Similarly, $O_2$ reports on the first ten lists after the videotape. If a participant used only one side of the paper for all ten lists, then there would be no pieces of paper with lists on both sides, and the value of $O_2$ would be 0; if the participant consistently used both sides of the paper, then there would be five pieces of paper with lists on both sides, and the value of $O_2$ would be 5; and if the

\textsuperscript{14}where: $R$ refers to the randomization procedure; $U_k$ refers to the amount of pre-manipulation practice of the undesirable behavior: $k = 1$ for little premanipulation practice (five lists), $k = 2$ for extensive premanipulation practice (30 lists); $P$ refers to the persuasive manipulation; $B$ refers to the behavioral reinforcement of the persuasive manipulation; $O_n$ refers to the $n$th observation of the dependent variable; and $Q$ refers to the administration of the questionnaire (attitude and demographic data).
participant used both sides of the paper for some of the first ten lists after the videotape and only one side for other lists, then the value of $O_2$ would be greater than 0 and less than 5.

The possible range for $O_n$ therefore depended on the number of lists on which it is based. For the initial set of practice trials in the Little Pre-Manipulation Repetition groups, (i.e., $O_1$, $O_4$, and $O_7$), the possible range was between 0 and 2. For the initial set of practice trials in the Extensive Pre-Manipulation Repetition groups, (i.e., $O_{10}$, $O_{13}$, and $O_{16}$), the possible range was between 0 and 15. In all groups, the possible range for the first ten lists post-manipulation (i.e., $O_2$, $O_5$, $O_8$, $O_{11}$, $O_{14}$, and $O_{17}$) was 0 to 5, as it was in the final ten of 30 lists post-manipulation (i.e., $O_3$, $O_6$, $O_9$, $O_{12}$, $O_{15}$, and $O_{18}$).

**Overview of the Data**

In order to provide a quick overview of the data, the design and procedure schematic is reproduced in Table 10-2, with the means of each observation added. Note that the design called for six groups (two control and four treatment groups) but, given the number of volunteers available, it was judged appropriate to drop one control group in order to increase the number of participants, therefore statistical power, in the remaining groups.

Note that the groups sizes were very similar. Tests of the data gathered for this study included the $t$-test and analysis of variance (ANOVA), which are robust to violations of homogeneity of variance as long as group sizes are equal. In this study, group sizes were not exactly equal, but they were close enough that the effect on $\alpha$ was negligible (Glass and Hopkins 1984: 238-240). Consequently, tests of homogeneity of variance were not performed in subsequent analyses.
Table 10-2  
Mean Number of Times Participants in Each Group Used Both Sides of the Paper at Various Points in the Experiment

<table>
<thead>
<tr>
<th>Little Pre-Manipulation Repetition of the Undesirable Behavior</th>
<th>Treatment</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>R</td>
<td>U₁</td>
<td>O₁</td>
<td>O₂</td>
<td>O₃</td>
</tr>
<tr>
<td>n = 22</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Persuasion</td>
<td>R</td>
<td>U₁</td>
<td>O₄</td>
<td>P</td>
<td>O₅</td>
</tr>
<tr>
<td>n = 23</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td>0.87</td>
</tr>
<tr>
<td>Persuasion + Behavior</td>
<td>R</td>
<td>U₁</td>
<td>O₇</td>
<td>P</td>
<td>B</td>
</tr>
<tr>
<td>n = 24</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td>2.92</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Extensive Pre-Manipulation Repetition of the Undesirable Behavior</th>
<th>Treatment</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>R</td>
<td>U₂</td>
<td>O₁₀</td>
<td>O₁₁</td>
<td>O₁₂</td>
</tr>
<tr>
<td>n = 0</td>
<td>n/a</td>
<td></td>
<td></td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Persuasion</td>
<td>R</td>
<td>U₂</td>
<td>O₁₃</td>
<td>P</td>
<td>O₁₄</td>
</tr>
<tr>
<td>n = 23</td>
<td>0.00</td>
<td></td>
<td></td>
<td>0.87</td>
<td>0.80</td>
</tr>
<tr>
<td>Persuasion + Behavior</td>
<td>R</td>
<td>U₂</td>
<td>O₁₆</td>
<td>P</td>
<td>B</td>
</tr>
<tr>
<td>n = 25</td>
<td></td>
<td></td>
<td></td>
<td>0.72</td>
<td>0.80</td>
</tr>
</tbody>
</table>

Another way to get an overview of the results is to look at how many participants in each group switched from using one side of the paper to using both sides. Table 10-3 provides that information.

Table 10-3  
Number of Participants Who Switched from Using One Side of the Paper to Using Both Sides

<table>
<thead>
<tr>
<th>Amount of Pre-Manipulation Repetition of the Undesirable Behavior</th>
<th>Treatment</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control</td>
<td>Persuasion</td>
<td>Persuasion</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td>Behavior</td>
</tr>
<tr>
<td>Little</td>
<td>0</td>
<td>4</td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extensive</td>
<td>n/a</td>
<td>5*</td>
<td>4**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Of the five participants in this group who switched from using one side of the paper to using both sides, three switched for all pairs of lists, one did so after the fifth pair of lists (of 15), and the other did so only for the first ten pairs of lists (of 15).

** Of the four participants in this group who switched from using one side of the paper to using both sides, three switched for all pairs of lists, and one did so after the second pair of lists (of 15).
A Note on Terminology

"Little Pre-Manipulation Repetition of the Undesirable Behavior" and "Extensive Pre-Manipulation Repetition of the Undesirable Behavior" are accurate descriptions of the type of behavior participants engaged in before seeing the videotape containing the behavior change manipulations. These descriptions are, however, lengthy and awkward when they are repeated many times. Consequently, a shorthand terminology was adopted here. Groups with "Little Pre-Manipulation Repetition of the Undesirable Behavior" are referred to as "Short" groups; and groups with "Extensive Pre-Manipulation Repetition of the Undesirable Behavior" are referred to as "Long" groups. Likewise, the "Persuasion" and "Persuasion + Behavior" manipulations are referred to as "Persuasion" and "Behavior."

These changes result in group names that are less accurately descriptive, but much less unwieldy:

- **Short Persuasion** refers to the group with "Little Pre-Manipulation Repetition of the Undesirable Behavior," followed by the "Persuasion" manipulation.
- **Short Behavior** refers to the group with "Little Pre-Manipulation Repetition of the Undesirable Behavior," followed by the "Persuasion + Behavior" manipulation.
- **Long Persuasion** refers to the group with "Extensive Pre-Manipulation Repetition of the Undesirable Behavior," followed by the "Persuasion" manipulation.
- **Long Behavior** refers to the group with "Extensive Pre-Manipulation Repetition of the Undesirable Behavior," followed by the "Persuasion + Behavior" manipulation.

The **Control** group in this experiment had "Little Pre-Manipulation Repetition of the Undesirable Behavior," and no behavior change manipulation.
Manipulation Check

The persuasive and behavioral manipulations were intended to produce more favorable attitudes towards using both sides of the paper in making the lists. For the manipulations to be judged successful, participants in the experimental groups should have more favorable attitudes toward using both sides of the paper than would participants in the control group.

Attitude to using both sides of the paper was measured by summing the three attitude subscales. ("In this study, using two sides of the paper is:" . . . good/bad; wise/foolish; beneficial/harmful.)

Table 10-4 shows the mean and standard deviation of the summed attitude measure for each group.

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>14.18</td>
<td>4.44</td>
<td>22</td>
</tr>
<tr>
<td>Short Persuasion</td>
<td>16.57</td>
<td>3.63</td>
<td>23</td>
</tr>
<tr>
<td>Short Behavior</td>
<td>17.74</td>
<td>3.92</td>
<td>23</td>
</tr>
<tr>
<td>Long Persuasion</td>
<td>17.86</td>
<td>2.52</td>
<td>21</td>
</tr>
<tr>
<td>Long Behavior</td>
<td>19.00</td>
<td>2.21</td>
<td>24</td>
</tr>
<tr>
<td>Entire Sample</td>
<td>17.10</td>
<td>3.76</td>
<td>113</td>
</tr>
</tbody>
</table>

A one-way ANOVA revealed that there were significant differences among the means \( F = 6.37, \ p = .0001 \). A planned contrast confirmed that participants in the experimental groups had more positive attitudes towards using both sides of the paper than did participants in the control group \( t = 4.41, \ p < .0001 \). On the basis of this result, it seems reasonable to conclude that the

---

\(^{15}\)The t-test and analysis of variance are robust to violations of the homogeneity of variance assumption when the group sizes are equal. In this study, group sizes are not exactly equal, but they are close enough that the effect on \( \alpha \) will be negligible (Glass and Hopkins 1984: 238-240). Consequently, tests of homogeneity of variance will not be performed in subsequent analyses of these data.
experimental manipulations were successful in producing more favorable attitudes towards using both sides of the paper.

A second issue concerning the experimental manipulations is whether some were more effective than others in producing favorable attitudes toward using both sides of the paper. If so, differences in the behavior produced by the manipulations could be attributed at least partly to their differential success in changing attitudes. This issue was addressed two ways.

First, a post-hoc multiple comparison test was employed. Since no hypotheses had been developed concerning the relative effectiveness of the manipulations in changing attitudes, planned contrasts were not appropriate. The Student-Newman-Keuls procedure, generally the preferred method of doing post-hoc multiple comparisons (Glass and Hopkins 1984), was therefore used to determine which pairs of groups were significantly different at the $\alpha = .05$ level of significance. The Student-Newman-Keuls method is one of several multiple comparison techniques that uses the studentized range statistic, $q$, to compare each mean with each and every other mean (Glass and Hopkins 1984). The procedure yields subsets of means that do not differ significantly. Table 10-5 shows the resulting subsets for the experimental data.\(^{16}\)

<table>
<thead>
<tr>
<th>SUBSET 1</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group</strong></td>
<td><strong>Control</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>14.18</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUBSET 2</th>
<th>Short Persuasion</th>
<th>Short Behavior</th>
<th>Long Persuasion</th>
<th>Long Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group</strong></td>
<td>16.57</td>
<td>17.74</td>
<td>17.86</td>
<td>19.00</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^{16}\)The statistical package used to analyze these data, SPSSpc+, does not provide the value of the studentized range statistic, $q$. For that reason, $q$ is not reported here.
According to this test, there was a significant difference between the control group and the experimental groups, but there were no significant differences among the four experimental groups in terms of attitude towards using both sides of the paper in this study.

A two-factor ANOVA was the second approach used to test whether the experimental manipulations were differentially effective in producing more favorable attitudes. Table 10-6 shows the same data as Table 10-4, but set up for the two-factor ANOVA. Table 10-7 shows the results of the ANOVA.

Table 10-6
Attitude Toward Using Both Sides of the Paper

<table>
<thead>
<tr>
<th>Amount of Pre-manipulation Practice</th>
<th>Persuasive Manipulation</th>
<th>Behavior Manipulation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>less (5 lists)</td>
<td>16.57</td>
<td>3.63</td>
</tr>
<tr>
<td>more (30 lists)</td>
<td>17.86</td>
<td>2.52</td>
</tr>
</tbody>
</table>

Table 10-7
Analysis of Variance: Effectiveness of Manipulations in Producing Favorable Attitudes

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practice</td>
<td>1</td>
<td>36.99</td>
<td>3.71</td>
<td>.057</td>
</tr>
<tr>
<td>Treatment</td>
<td>1</td>
<td>30.47</td>
<td>3.06</td>
<td>.084</td>
</tr>
<tr>
<td>Practice × Treatment</td>
<td>1</td>
<td>00.01</td>
<td>&lt;.01</td>
<td>.981</td>
</tr>
</tbody>
</table>

The results in Table 10-7 are consistent with those of the multiple comparison. Both tests indicate that the attitudes generated by the manipulations did not differ significantly among the experimental groups.

Another issue related to the manipulation check concerns the role that concomitant variables might play in participants' behavior. Analysis of covariance (ANCOVA) was used to examine the effects of the following concomitant variables on participants' behavior after the manipulations: sex, age, size of home community, academic degree sought, and importance of environmental issues. Three ANCOVAs were performed. The first examined the effect of the concomitant variables on
whether participants used one or both sides of the paper in the first ten lists post-manipulation. None
of the concomitant variables had a significant effect (for sex, $F = 1.31$, $p = 0.25$; for age, $F =
0.08$, $p = 0.78$; for size of home community, $F = 0.01$, $p = 0.78$; for degree sought, $F = 2.19$,
$p = 0.14$; and for importance of environmental issues, $F = 0.61$; $p = 0.44$).

The second ANCOVA examined the effect of the concomitant variables on whether
participants used one or both sides of the paper in the final ten of the 30 post-manipulation lists.
Again, none of the concomitant variables had a significant effect (for sex, $F = 1.70$, $p = 0.20$; for
age, $F = 1.66$, $p = 0.20$; for size of home community, $F = 0.002$, $p = 0.96$; for degree sought,
$F = 2.13$, $p = 0.15$; and for importance of environmental issues, $F = 1.42$; $p = 0.24$).

The third ANCOVA examined the effect of the concomitant variables on whether participants
used one or both sides of the paper in the whole series of 30 post-manipulation lists. Here, too, none
of the concomitant variables had a significant effect (for sex, $F = 1.76$, $p = 0.19$; for age, $F =
0.74$, $p = 0.39$; for size of home community, $F = 0.01$, $p = 0.95$; for degree sought, $F = 2.09$,
$p = 0.15$; and for importance of environmental issues, $F = 0.92$; $p = 0.34$).

These results rule out the possibility that resource use after the manipulations could be due
to sex, age, size of home community, and importance of environmental issues17.

**Hypotheses Concerning Groups with Less Premanipulation Task Experience**

The first set of hypotheses concerns the groups with less task experience. Participants in the
Control, Short Persuasion, and Short Behavior groups completed only five lists before viewing the
videotape in which the manipulations were delivered. According to the theory developed earlier in

---

17It may seem surprising that participants’ evaluation of the importance of environmental issues in
their own lives would not have a significant effect on their resource use. Actually, it is not surprising
at all, for two reasons. First, it is well established that in the area of environmental issues, what
people say and what they do are often independent; second, it is also well established that global
attitudes are very poor predictors of specific behaviors. Therefore, even when people say that the
environment is important in their lives, their behavior in any specific context may not reflect that
degree of importance.
this dissertation research, it should be relatively easy to effect change in these groups, as the undesirable behavior has not been practised enough to become habit-like. Results of tests of the specific hypotheses and certain underlying assumptions are detailed below.

**Assumption 1A.** It was assumed that all participants in the low-practice groups (Control, Short Persuasion, Short Behavior) would initially do the task using one side of the paper only. This assumption was verified by counting the number of times each participant used both sides of the paper in the first series of lists (before the videotape containing the manipulations was shown). All participants in the low-practice groups did all lists in the first series using only one side of the paper. Assumption 1A is therefore confirmed.

**Assumption 1B.** It was assumed that in the low practice groups, the task itself would not induce participants to switch from using one side of the paper to using both sides of the paper. This assumption was verified by counting the number of times participants in the Control group (who received no manipulation encouraging them to switch from using one side to using both sides of the paper) used both sides of the paper in the five lists completed before the videotape was shown, in the ten lists immediately following the videotape, and in the final ten of the 30 lists made after the videotape was shown. All participants in the Control group ($n = 22$) used only one side of the paper throughout the study. Assumption 1B is therefore confirmed.

**Hypothesis 1A.** The statement of this hypothesis in theoretical terms is:

If the undesirable behavior has not been extensively repeated (i.e., has not become habit-like), then a persuasive message that produces (or activates) a (more) positive attitude toward the desirable behavior will induce the desirable behavior.

In the context of this study, the undesirable behavior is the use of one side of the paper; and the desirable behavior is the use of both sides of the paper. Hypothesis 1A was tested two ways. First, participants in the Control and Short Persuasion groups were compared in terms of the mean number of times they used both sides of the paper in the ten lists immediately following the videotape was compared. As Table 10-8 shows, none of the participants in the Control group used both sides of
the paper after viewing the videotape; however, on average, participants in the Short Persuasion group used both sides of the paper .87 times in the ten lists immediately following the video (where five times would be the maximum possible). This represents a significant difference between the two groups ($t = 2.07$, $p = .022$).

**Table 10-8**  
Comparison of the Average Number of Times Participants in the Control and Short Persuasion Groups Used Both Sides of the Paper for Lists Immediately Following the Videotape

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
<th>$t$-value</th>
<th>$p$ (1-tail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>0.00</td>
<td>0.00</td>
<td>22</td>
<td>2.07</td>
<td>.022</td>
</tr>
<tr>
<td>Short Persuasion</td>
<td>0.87</td>
<td>1.94</td>
<td>23</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hypothesis 1A was also evaluated with the binomial test, a nonparametric test that was used to indicate whether the proportion of participants in the Short Persuasion Group who switched from using one side of the paper to using both sides ($4/23 = 0.17$) was significantly greater than that in the Control group ($0/22 = 0.00$). The binomial test confirmed that the proportions were significantly different ($p < .0001$).

Based on the results of the $t$-test and the binomial test, Hypothesis 1A is supported.

**Hypothesis 1B.** The statement of Hypothesis 1B in theoretical terms is:

If the undesirable behavior has not been extensively repeated (i.e., has not become habit-like), then a manipulation that both induces positive attitudes toward the desirable behavior and reinforces positive attitudes through limited practice of the desirable behavior will also induce the desirable behavior in the post-manipulation period.

Hypothesis 1B was tested by comparing the mean number of times participants in the Control and Short Behavior groups used both sides of the paper in the ten lists immediately following the videotape. As Table 10-9 shows, none of the participants in the Control group used both sides of the paper after viewing the videotape; however, on average, participants in the Short Behavior group used both sides of the paper 2.92 times in the ten lists immediately following the video (where five
times would be the maximum possible). This represents a significant difference between the two groups ($t = 5.67, p < 0.001$).

**Table 10-9**

Comparison of the Average Number of Times Participants in the Control and Short Behavior Groups Used Both Sides of the Paper for Lists Immediately Following the Videotape

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
<th>t-value</th>
<th>p (1-tail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>0.00</td>
<td>0.00</td>
<td>22</td>
<td>5.67</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Short Behavior</td>
<td>2.92</td>
<td>2.52</td>
<td>24</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hypothesis 1B was also evaluated with the binomial test, a nonparametric test that was used to indicate whether the proportion of participants in the Short Behavior Group who switched from using one side of the paper to using both sides ($14/23 = 0.61$) was significantly greater than that in the Control group ($0/22 = 0.00$). The binomial test confirmed that the proportions were significantly different ($p < .0001$).

Based on the results of the $t$-test and the binomial test, Hypothesis 1B is supported.

A stronger statement of Hypothesis 1B would be:

If the undesirable behavior has not been extensively repeated (i.e., has not become habit-like), then a manipulation that both induces positive attitudes toward the desirable behavior and reinforces positive attitudes through limited practice of the desirable behavior will be no more effective in inducing the desirable behavior in the post-manipulation period than will a manipulation that (merely) induces positive attitudes toward the desirable behavior.

The issue of whether the persuasive manipulation alone was as effective as the behavioral manipulation was addressed with a $t$-test, as shown in Table 10-10.

**Table 10-10**

Comparison of the Average Number of Times Participants in the Short Persuasion and Short Behavior Groups Used Both Sides of the Paper for Lists Immediately Following the Videotape

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
<th>t-value</th>
<th>p (2-tail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short Persuasion</td>
<td>0.87</td>
<td>1.94</td>
<td>23</td>
<td>3.13</td>
<td>.003</td>
</tr>
<tr>
<td>Short Behavior</td>
<td>2.92</td>
<td>2.52</td>
<td>24</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The results of the $t$-test indicate that, in the first ten lists after the videotape, participants in the Short Behavior group used both sides of the paper significantly more often than did participants in the Short Persuasion group (means of 2.92 times and 0.87 times, respectively; $t = 3.13, p = .003$).

A chi-square test was also performed to determine whether participants in the Short Persuasion and Short Behavior groups were equally likely to switch from using one side of the paper to using both sides. In the Short Persuasion group, 4 of 23 participants (17.4%) switched; in the Short Behavior group, 14 of 24 participants (58.3%) switched. This represents a significant difference ($\chi^2 = 8.33, p < .004$).

Based on the results of the $t$-test and the chi-square test, the strong form of Hypothesis 1B is rejected.

**Hypothesis 1C.** The statement of this hypothesis in theoretical terms is:

If the undesirable behavior has not been extensively repeated (i.e., has not become habit-like), then as experience with the situation accumulates, the behavior change induced by a manipulation that both induces positive attitudes toward the desirable behavior and reinforces positive attitudes through limited practice of the desirable behavior will be sustained better than the behavior change induced by a persuasive message that produces (or activates) a (more) positive attitude toward the desirable behavior.

Hypothesis 1C was evaluated by comparing the number of times participants in the Short Behavior and Short Persuasion groups used both sides of the paper in the first ten lists following the videotape with the number of times they used both sides of the paper in the final ten (of 30) lists. In both groups, all participants maintained the same behavior for all lists following the videotape. All participants in the Short Persuasion and Short Behavior groups who used both sides of the paper in the first ten lists following the videotape continued to use both sides of the paper for all 30 lists. Hypothesis 1C is therefore rejected.
Hypotheses Concerning Groups with More Premanipulation Task Experience

The second set of hypotheses concerns the groups with more task experience. Participants in the Long Persuasion and Long Behavior groups completed 30 lists before viewing the videotape in which the manipulations were delivered. According to the theory developed earlier in this dissertation research, it should be relatively difficult to effect change in these groups, as the undesirable behavior has been practised enough to become habit-like. Results of tests of the specific hypotheses and certain underlying assumptions are detailed below.

Note that there was no control group among the groups with more premanipulation task experience. Given the number of participants available, it was decided to sacrifice this control group in order to increase numbers (and, therefore, power) in the treatment groups.

Assumption 2A. As in the groups with less premanipulation task experience, it was assumed that all participants would use only one side of the paper before seeing the videotape. This assumption was verified by counting the number of times each participant used both sides of the paper in the first series of lists (before the videotape containing the manipulations was shown). All participants in the high-practice groups did all lists in the first series using only one side of the paper. Assumption 2A is therefore confirmed.

Assumption 2B. It was assumed that, as in the low practice groups, the task itself would not induce high practice participants to switch from using one side of the paper to using both sides of the paper. Assumption 2B was not tested.

Hypothesis 2A. The statement of this hypothesis in theoretical terms is:

If the undesirable behavior has been extensively repeated (i.e., has become habit-like), then a persuasive message that produces a positive attitude toward the desirable behavior will not induce the desirable behavior in the post-manipulation period.

Hypothesis 2A was tested by examining the mean number of times participants in the Long Persuasion group used both sides of the paper in the first ten and the last ten (of 30) lists after the videotape was shown. As Table 10-11 shows, on average, participants in the Long Persuasion group
used both sides of the paper 0.87 times (out of a maximum of five) in both the first ten lists and the last ten lists after the videotape. A t-test indicates that this value is significantly greater than zero ($t = 2.15, p = .022$). This result does not support Hypothesis 2A.

**Table 10-11**

Comparison of the Average Number of Times Participants in the Long Persuasion Group Used Both Sides of the Paper for Lists Following the Videotape

<table>
<thead>
<tr>
<th>Post-manipulation Lists</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>First ten</td>
<td>0.87</td>
<td>1.94</td>
<td>23</td>
</tr>
<tr>
<td>Final ten</td>
<td>0.87</td>
<td>1.94</td>
<td>23</td>
</tr>
</tbody>
</table>

Hypothesis 2A was also evaluated with the binomial test, a nonparametric test that was used to indicate whether the proportion of participants in the Long Persuasion Group who switched from using one side of the paper to using both sides ($5/23 = 0.22$) was significantly greater than zero. The binomial test confirmed that the proportion was significantly different ($p < .0001$), again failing to support Hypothesis 2A.

On the basis of the results of the $t$-test and the binomial test, Hypothesis 2A is rejected.

**Hypothesis 2B.** The statement of this hypothesis in theoretical terms is:

If the undesirable behavior has been extensively repeated (i.e., has become habit-like), then a manipulation that both induces positive attitudes toward the desirable behavior and reinforces those positive attitudes through limited practice of the desirable behavior will induce the desirable behavior in the post-manipulation period.

Hypothesis 2B was tested by examining the mean number of times participants in the Long Behavior group used both sides of the paper in the first ten (of 30) lists after the videotape was shown. As Table 10-12 shows, on average, participants in the Long Persuasion group used both sides of the paper 0.72 times (out of a maximum of five) in the first ten lists after the videotape. A $t$-test indicates that this value is significantly greater than zero ($t = 2.09, p = .024$). This result supports Hypothesis 2B.
Table 10-12
Average Number of Times Participants in the Long Behavior Group Used Both Sides of the Paper for Lists Immediately Following the Videotape

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
<th>t-value</th>
<th>p (1-tail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long Behavior</td>
<td>0.72</td>
<td>1.72</td>
<td>25</td>
<td>2.09</td>
<td>.024</td>
</tr>
</tbody>
</table>

Hypothesis 2B was also evaluated with the binomial test, a nonparametric test that was used to indicate whether the proportion of participants in the Long Behavior Group who switched from using one side of the paper to using both sides (4/25 = 0.16) was significantly greater than zero. The binomial test confirmed that the proportion was significantly different (p < .0001), providing additional support for Hypothesis 2B.

Based on the results of the t-test and the binomial test, Hypothesis 2B is supported.

**Hypothesis 2C.** The statement of this hypothesis in theoretical terms is:

If the undesirable behavior has been extensively repeated (i.e., has become habit-like), then as experience with the situation accumulates, behavior change induced by a manipulation that both induces positive attitudes toward the desirable behavior and reinforces those attitudes through limited practice of the desirable behavior will decay.

Hypothesis 2C was evaluated by comparing, for participants in the Long Behavior group, the number of times both sides of the paper was used in the first ten lists after the videotape with the number of times both sides of the paper was used in the final ten (of 30) lists after the videotape. As Table 10-13 shows, contrary to Hypothesis 2C, use of both sides of the paper actually increased slightly, although the increase was not statistically insignificant (t = 1.00, p = .327).

Table 10-13
Comparison of the Average Number of Times Participants in the Long Behavior Group Used Both Sides of the Paper for Lists Following the Videotape

<table>
<thead>
<tr>
<th>Post-manipulation Lists</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>First ten</td>
<td>0.72</td>
<td>1.72</td>
<td>25</td>
</tr>
<tr>
<td>Final ten</td>
<td>0.80</td>
<td>1.87</td>
<td>25</td>
</tr>
</tbody>
</table>

Hypothesis 2C is therefore rejected.
**Hypothesis 2D.** The statement of this hypothesis in theoretical terms is:

If the undesirable behavior has been extensively repeated (i.e., has become habit-like) then as experience with the situation accumulates, behavior change induced by a manipulation that both induces positive attitudes toward the desirable behavior and reinforces those positive attitudes through limited practice of the desirable behavior will be greater than behavior change (if any) following a manipulation that produces a positive attitude toward the desirable behavior.

Hypothesis 2D was evaluated by comparing the number of times participants in the Long Persuasion and Long Behavior groups used both sides of the paper in the last ten lists (of 30) following the videotape. As Table 10-14 shows, contrary to the prediction in Hypothesis 2D, participants in the Long Persuasion group used both sides of the paper more frequently than did participants in the Long Behavior group, although the difference is not statistically significant.

**Table 10-14**

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
<th>t-value</th>
<th>p (2-tail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long Persuasion</td>
<td>0.87</td>
<td>1.94</td>
<td>23</td>
<td>0.13</td>
<td>.900</td>
</tr>
<tr>
<td>Long Behavior</td>
<td>0.80</td>
<td>1.87</td>
<td>25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hypothesis 2D is therefore rejected.

**Hypotheses Concerning the Relative Effectiveness of the Manipulations Across Different Levels of Premanipulation Task Experience**

The third set of hypotheses concerns the relative effectiveness of persuasion alone versus persuasion with behavioral reinforcement depending on whether the undesirable behavior had been extensively practised.
**Hypothesis 3A.** The statement of this hypothesis in theoretical terms is:

A manipulation that merely induces (or activates) (more) positive attitudes toward the desirable behavior will be less effective if the undesirable behavior has been extensively repeated (i.e., has become habit-like) than if the undesirable behavior has not been extensively repeated.

Hypothesis 3A was tested by comparing the number of times participants in the Short Persuasion and Long Persuasion groups used both sides of the paper in the ten lists immediately following the videotape. As Table 10-15 shows, contrary to Hypothesis 3A, the persuasive manipulation was equally effective when the undesirable behavior had been extensively repeated and when it had not been extensively repeated.

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
<th>t-value</th>
<th>p (2-tail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short Persuasion</td>
<td>0.87</td>
<td>1.94</td>
<td>23</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Long Persuasion</td>
<td>0.87</td>
<td>1.94</td>
<td>23</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hypothesis 3A is therefore rejected.

**Hypothesis 3B.** The statement of this hypothesis in theoretical terms is:

A manipulation that both induces (or activates) (more) positive attitudes toward the desirable behavior and reinforces that behavior with limited practice will be equally effective whether or not the undesirable behavior has been extensively repeated (i.e., has become habit-like).

Hypothesis 3B was tested by comparing the number of times participants in the Short Behavior and Long Behavior groups used both sides of the paper in the ten lists immediately following the videotape. As Table 10-16 shows, contrary to Hypothesis 3B, the behavioral manipulation was more effective when the undesirable behavior had not been extensively repeated than when it had been extensively repeated.
Summary of the Experimental Results

There were several unexpected and interesting findings from this experiment. First, when the undesirable behavior had not been extensively practised (i.e., had not become habit-like), a manipulation that both induced positive attitudes toward the desirable behavior and reinforced those positive attitudes through limited practice of the desirable behavior was more effective in inducing the desirable behavior than was a manipulation that merely induced positive attitudes. In other words, in the volitional group, the persuasion + behavior manipulation was more effective than the persuasive manipulation. Furthermore, based on analyses associated with the manipulation check, the difference in effectiveness cannot be accounted for by differences in attitude toward the desirable behavior, as there is no significant difference between the groups on that variable.

The second unexpected and interesting finding was that when the undesirable behavior had been extensively practised (i.e., had become habit-like), there was no advantage to the behavioral reinforcement. In other words, in the "habit-like" group, the behavioral manipulation was no more effective than was the persuasive manipulation. In fact, reinforcing the persuasive manipulation with limited practice of the desirable behavior was slightly less effective than the persuasive manipulation alone, although the difference was not statistically significant.

The third unexpected and interesting finding was that merely inducing a positive attitude toward the desirable behavior was equally effective whether the undesirable behavior had been extensively practised or not; however, the same was not true when the positive attitudes were
reinforced with limited practice. In the latter situation, the behavioral manipulation was significantly more effective in changing the behavior of participants who had had less premanipulation experience with the undesirable behavior. In other words, the persuasive manipulation worked equally well in both the "habit-like" and "volitional" groups, but the behavioral manipulation worked better in the "non-habit" group than it did in the "habit-like" group.

The fourth unexpected and interesting finding is that, at the point when participants in the Short Behavior group had done the same total number of lists as the Long Behavior group had done by the end of the videotape (i.e., 45 lists), they did not, unlike the Long Behavior participants, switch back to using one side of the paper.

As in many exploratory studies, this experiment raises many new and interesting questions. The following chapter will discuss some of those questions, and point out additional factors and variables which will need to be explored in future research.
CHAPTER 11
STUDY 2: DISCUSSION

The previous two chapters described the design, analysis, and results of an experiment intended to test some of the theory developed in Chapter 8, which concerns the way that complex, habit-like behaviors change. The theory proposed that such change proceeds in three steps: de-automation of the old habit-like behavior, volitional change of that behavior, and consolidation of the new behavior. Based on this theory, it was predicted that persuasion-based approaches to behavior change would be effective in changing behavior that had not yet been practised enough to become habit-like; but for behaviors that had been practised extensively enough to be considered habitual or habit-like, persuasion alone would not be enough — behavioral reinforcement would also be necessary.

To test these predictions, a laboratory experiment was run. Participants were asked to make a series of lists, each on a different page of a four-by-six-inch pad of paper. Some of them did five lists (little pre-manipulation practice), and some did 30 lists (extensive pre-manipulation practice). At this stage, all the participants used only one side of the paper. Then the manipulations were delivered. Some participants received a persuasive message suggesting that they use both sides of the paper, and some received the same persuasive message reinforced with limited practice of the desired behavior. The dependent variable was the number of times participants used both sides of
the paper in lists made after the manipulation was delivered. As Chapter 10 indicated, results of the experiment were mixed, with several unexpected and interesting findings.

This chapter discusses theoretical and methodological issues arising from Study 2. It begins with a brief discussion of the experimental procedure itself. The organization of the remainder of the chapter parallels that of Chapter 10, examining first the results obtained in the Little Pre-Manipulation Practice groups, then those for the Extensive Pre-Manipulation Practice groups, and finally those comparing the effectiveness of the manipulations across the two levels of pre-manipulation practice.

The Experimental Procedure

As the review of the demarketing literature which appears in Chapter 2 indicates, there has been little empirical research done in this area. Furthermore, there is almost no experimental research. This gap may be due to the difficulty of designing an experimental procedure that captures the critical aspects of demarketing problems: people have become accustomed to using the resource wastefully; the resource is merely a means to an end; changing behavior to use less of the resource is costly (though not necessarily in financial terms); conserving the resource has uncertain returns that will accrue in the future, probably to people other than those making the effort; and there is no obvious reason (such as a shortage of the resource) to conserve. (See Chapter 9 for a more complete discussion of these criteria.)

The procedure used in this experiment meets these criteria and therefore opens the door to further experimental research in demarketing. There were limitations, as the discussion below indicates, but they were of an operational nature. The basic procedure seems to have been successful in simulating the key characteristics of demarketing problems.
Little Pre-Manipulation Practice Groups

Participants in the Little Pre-Manipulation groups completed only five lists before receiving the manipulation. Such minimal practice is very unlikely to lead to habitual or habit-like use of one side of the paper for the list-making task. It was expected that, since the use of one side of the paper for this task was not habitual, a persuasive message alone should be enough to convince participants to change their behavior. A persuasive message reinforced with limited practice of the desired behavior (using both sides of the paper) was also expected to be effective, but no more effective than the persuasive message alone. In other words, when the behavior is not habitual or habit-like, a persuasive message alone should lead to behavior change; behavioral reinforcement would be redundant.

As expected, the results showed that the persuasive message alone did lead to behavior change. Also as expected, a persuasive message reinforced with limited behavioral practice was effective. However, contrary to expectations, persuasion with behavioral reinforcement was much more effective than persuasion alone: 56% of participants who received a persuasive message and had an opportunity to practice using both sides of the paper switched, while only 17% of those who received the persuasive message alone switched. In this experiment, it appears that behavioral reinforcement was anything but redundant. Another unexpected result was that there was no decay in the conservation behavior of either the participants exposed to the persuasive message alone or those exposed to both a persuasive message and behavioral reinforcement. The unexpected results raise both methodological and theoretical issues.

Methodological Issues. On the methodological side, one explanation for the strong effect of behavioral reinforcement is that, because the number of lists done in the behavioral reinforcement portion of the experiment was three times the number done in the pre-manipulation practice portion (15 lists for behavioral reinforcement versus five lists for pre-manipulation practice), the behavioral reinforcement may have swamped the effect of the pre-manipulation practice. It could be argued that
participants with little pre-manipulation practice in the Persuasion + Behavior group got three times as much practice using two sides of the paper as using one side. It is possible that for a task as simple as the one in the experiment a level of practice between five and fifteen lists might be enough to form a habit-like tendency to use two sides of the paper.

The counterargument is that participants in the Persuasion + Behavior group did not really have 15 opportunities to use both sides of the paper; they only had seven. Only on the even numbered lists could a participant use the second side of the paper. Consequently, although there was an imbalance between the pre-manipulation practice and the behavioral reinforcement, it was not as large as it might initially seem. Nevertheless, without further research the possibility that that difference may have been large enough to cause the unexpected result cannot be eliminated.

Further research using this experimental procedure should balance the number of pre-manipulation lists (which, based on the experience in this experiment, people invariably do one-sided) with the number of two-sided lists done in the manipulation. For instance, if five lists are done in the pre-manipulation period, then ten lists should be done for behavioral reinforcement (providing five opportunities to practice using the second side of the paper).

A second possible methodological explanation for the unexpected importance of behavioral reinforcement in the Little Pre-manipulation Practice group concerns the strength of the persuasive message, particularly relative to the strength of the behavioral reinforcement. The persuasive message delivered in the videotape was:

> We are finding that a lot of paper is being wasted in this study, since we have to have each list on a separate page and most people use only one side of the paper. If you could use both sides of the paper, that would waste less paper and save a few trees. Whether you use one side or two makes no difference to the study, but it would be good for the environment.
If persuasive messages can be thought of as being on a continuum from "soft sell" to "hard sell," this one would clearly be closer to the soft sell end\(^{18}\). A soft sell message was preferable to a hard sell message for two reasons. First, a hard sell message might be perceived by participants as an instruction. Second, if the message were too attention-getting, it might raise suspicions in participants' minds concerning the true purpose of the study. If either of these eventualities occurred, changes in behavior unrelated to participant attitudes toward conservation would likely occur.

Nevertheless, even given that a soft sell message was desirable, the particular message used in this experiment cannot be called persuasive in the sense of making any real attempt to change attitudes toward using both sides of the paper. Rather, its purpose was to activate existing attitudes.

In contrast, the behavioral reinforcement was directed, focused, and relatively hard sell. However, it cannot be said that it was so hard sell as to be mistaken for instructions or to raise suspicions, since only 37% of all participants exposed to it (i.e., participants in the Persuasion + Behavior condition for both the Little and Extensive Pre-Manipulation Practice groups) changed their behavior.

Future research should seek a better balance between the strength of the persuasive message and the strength of the behavioral reinforcement. One way to strengthen the persuasive message without drawing too much attention to it or having it be perceived as instructions might be to alter the experimental task and cover story slightly. The study could be presented as an investigation of the memorability of persuasive messages. The same network model of memory could be explained and the basic procedure would stay the same, except that participants would view a series of ads

\(^{18}\)Although closer to the soft sell end of the persuasive continuum than to the hard sell end, the message used in the experiment was not the softest sell; an even milder version was pretested. In a category called "Things you can do to help the environment" the following explanation was given:

This is a big category. There are so many things we can do. In this category I would list things like recycling soft drink cans, recycling newspapers, recycling glass, . . . , and even using two sides of the paper in this experiment."

It changed no one's behavior in the pretest.
(instead of making a series of lists), after each of which (or after having seen, say, a batch of five), they would write down on a piece of paper all that they remember from the ad. The ads before the manipulations would have no connections with each other; the ads after would. The persuasive message to use both sides of the paper would be delivered during the explanation of the network model, just as it was in the present experiment, but it could be delivered in a much more openly persuasive manner, as it would be just another one of many persuasive messages to which participants were being exposed.

The explanation for the lack of decay among participants who switched to using two sides of the paper may also be due to a methodological flaw: the number of post-manipulation lists may have been too few, and too close in time to the manipulations. An option for future research is to do 30 lists after the manipulations have been delivered, as was done in this experiment, then add another distractor videotape, and then do another series of lists.

Theoretical Issue. The unexpected findings also raise a theoretical issue. Why would Persuasion + Behavior be so much more effective than Persuasion alone when the wasteful behavior had been practised so little that it is unlikely to have become habitual or habit-like? One possible explanation relates to the role of involvement.

Zaichkowsky (1985) defines involvement as "a person's perceived relevance of the object based on inherent needs, values, and interests" (p. 342). People whose involvement with an object is high tend to process more information about it than do people whose involvement with an object is low. Petty, Cacioppo, and Schumann (1983) differentiate between "central" and "peripheral" routes to attitude change. The former involves relatively deep processing of relevant information, while the latter involves relatively shallow processing:

[T]he central route views attitude change as resulting from a person’s diligent consideration of information that s/he feels is central to the true merits of a particular attitudinal position... Attitude changes induced via the central route are postulated to be relatively enduring and predictive of behavior.
Attitude changes that occur via the peripheral route do not occur because an individual has personally considered the pros and cons of the issue, but because the attitude issue or object is associated with positive or negative cues — or because the person makes a simple inference about the merit of the advocated position based on various simple cues in the persuasion context. . . Attitude changes induced under the peripheral route are postulated to be relatively temporary and unpredictable of behavior (Petty, Cacioppo, and Schumann 1983: 135-136).

In this experiment, where the paper is merely a means to an end, and there is plenty of extra paper in full view (so participants anticipate no impending shortage), involvement with the resource would tend to be low. This is consistent with what would normally occur in a typical demarketing situation: the resource is taken for granted.

Given that involvement with the resource is low, the peripheral route would be favored. Consequently, in the Little Pre-Manipulation Practice groups, the persuasive message alone would merely act as a cue to attitudes toward conservation. Most participants would continue to use one side of the paper because they were not involved enough to bother assessing the pros and cons of changing their behavior. However, when the persuasive message was reinforced with limited behavioral practice, participants gained experience with both behavioral options: their initial experience was using one side of the paper, while their later experience was using both sides of the paper. Once they tried both options (i.e., weighed the pros and cons), more than half switched to the desired behavior.

This raises an interesting question. Compelling participants to try the two-sided option essentially forced them to consider (or at least experience) the pros and cons of switching. In other words, they were emulating the deeper, central route to persuasion. The question is: did this increase participants’ level of involvement with the resource, or could the emulation of the deeper, central route to persuasion constitute some sort of increased pseudo-involvement? Unfortunately, involvement was not measured at any point in this experiment, so these data cannot answer that
question. There is no way to tell from Study 2 data whether involvement with the resource increased or stayed the same when participants used both sides of the paper.

The data from this experiment suggest that, in situations where people have not developed habits or habit-like behaviors, demarketing programs that can get people to act as if they had a higher level of involvement (it is unknown at this point whether their real level of involvement actually increases) will be more effective than demarketing programs that do not increase people's level of involvement. Clearly, more theory concerning the role of involvement and, if it exists, pseudo-involvement, needs to be developed. That is a task for future research.

**Extensive Pre-Manipulation Practice Groups**

Participants in the Extensive Pre-Manipulation groups completed 30 lists before receiving the manipulation. Based on pretests, that level of practice was assumed to lead to habitual or habit-like use of one side of the paper for the list-making task. It was expected that, since the use of one side of the paper for this task was habitual or habit-like, a persuasive message alone should not be enough to convince participants to change their behavior. A persuasive message reinforced with limited practice of the desired behavior (using both sides of the paper) was expected to be effective. In other words, when the behavior is habitual or habit-like, a persuasive message alone should not lead to behavior change; behavioral reinforcement would also be necessary.

As expected, a persuasive message reinforced with limited behavioral practice was effective. But, contrary to expectations, the persuasive message alone did lead to behavior change. In addition, also contrary to expectations, persuasion with behavioral reinforcement was no more effective than persuasion alone: 22% of participants who received a persuasive message alone switched, while 17% of those who received the persuasive message reinforced by limited practice of the desired behavior switched (the difference was not statistically significant). In this experiment, it appears that behavioral reinforcement added nothing. Another unexpected result was that there was no decay in
the conservation behavior of either the participants exposed to the persuasive message alone or those exposed to both a persuasive message and behavioral reinforcement. The unexpected results raise both methodological and theoretical issues.

Methodological Issues. On the methodological side, the explanation for the lack of decay among participants who switched to using two sides of the paper is the same as it was for the Little Pre-manipulation Practice groups: the number of post-manipulation lists may have been too few, and too close in time to the manipulations. Again, an option for future research is to do 30 lists after the manipulations have been delivered, as was done in this experiment, then add another distractor videotape, and then do another series of lists.

The more serious question concerns why the behavioral reinforcement added nothing. One possibility is that the behavioral reinforcement simply was not strong enough. Participants in the Extensive Pre-Manipulation Practice groups had done 30 lists using one side of the paper. Those in the Persuasion + Behavior group made 15 lists during the behavioral reinforcement portion of the experiment. This represents only seven opportunities to use the second side of the paper. It may be that the amount of behavioral reinforcement needed to overcome a habitual or habit-like behavior would be in the same range as the original amount of pre-manipulation practice. The results for the Little Pre-Manipulation groups are consistent with this suggestion. Efforts should be made in future research to determine what relative levels of behavioral reinforcement are necessary to overcome the effects of existing practice.

Theoretical Issue. The unexpected findings may also have a more theoretical explanation. It may be that, as people who habitually waste a resource gain experience with using less of it, they become more aware of the costs (e.g., inconvenience) associated with changing their behavior. In other words, the behavioral reinforcement actually reminds them of all the reasons they do not want to switch from using one side of the paper to using both sides (and in this experiment, the disadvantages of using both sides of the paper would have been very evident to participants, because
they were under time pressure, and using both sides of the paper slowed them down). This would be less likely to occur among people whose behavior is not habitual or habit-like simply because their system for doing the task is (by definition) more flexible, so it is easier for them to accommodate changes.

In Chapter 8, it was proposed that changing habits or habit-like behaviors proceeds in three steps: de-automation, volitional behavior change, and consolidation. It was pointed out there that de-automation requires, first, that people know precisely what behavior(s) to change, second, that they can reliably anticipate the performance of the behavior, and third, that they have enough motivation to invest the cognitive energy necessary to bring the habit under conscious control. At this preliminary stage in testing the theory, choices were made concerning which variables to manipulate, and which ones not to manipulate. The criterion used was the likely importance of the variable in explaining and predicting behavior. In the absence of previous empirical tests of the theory, the decision was made not to manipulate motivation. Based on the results in the Extensive Pre-Manipulation Practice groups, it would seem worthwhile for future research to investigate more closely the role of motivation.

**Relative Effectiveness of the Manipulations Across Pre-Manipulation Levels**

There were also unexpected results when the manipulations (Persuasion alone or Persuasion + Behavior) were compared across different levels of pre-manipulation practice. Specifically, it was expected that Persuasion alone would be more effective for people who had had Little Pre-Manipulation Practice of the undesirable behavior than for people who had had extensive Pre-Manipulation Practice, because persuasion alone should not be powerful enough to overcome habitual or habit-like tendencies. In this experiment, however, Persuasion was equally effective for both Little and Extensive Pre-Manipulation Practice. It was also expected that Persuasion + Behavior would be equally effective for both levels of Pre-Manipulation Practice. Unexpectedly, it was more
effective for the Little Pre-Manipulation Practice group than for the Extensive Pre-Manipulation group.

The first unexpected result, that Persuasion alone was equally effective for both Little and Extensive Pre-Manipulation Practice, might be explained as a methodological weakness. If, as seems likely, the persuasive message used in the manipulation did not change attitudes, but merely activate existing attitudes, then the only people to switch would be those who had existing favorable attitudes toward conserving paper by using both sides. The fact that the same percentage of each group switched tends to support this explanation: if attitudes toward using both sides of the paper are randomly distributed through the population, then a random assignment of participants should yield the same proportions of participants with existing positive attitudes toward using both sides of the paper. As noted earlier, attention should be paid in future research to ensuring that the persuasive message is actually persuasive, not just something that activates existing favorable attitudes, if any.

The second unexpected result, that Persuasion + Behavior was more effective for the Little Pre-Manipulation Practice group than for the Extensive Pre-Manipulation group, is also consistent with earlier explanations. Specifically, in the Little Pre-Manipulation Practice group, the behavioral reinforcement may have caused participants to increase involvement, or pseudo-involvement, with the decision to use one or both sides of the paper, which led a sizeable number of them to change their behavior. In contrast, in the Extensive Pre-Manipulation Practice group, the behavioral reinforcement may have made salient the costs (in terms of inconvenience, loss of speed, etc.), thereby actually discouraging switching — once again highlighting the importance of motivation in the de-automation process.

Summary

Chapter 11 has discussed some of the theoretical and methodological issues arising from Study 2. The chapter began with an evaluation of the suitability of the experimental procedure as
a method for studying typical demarketing problems. The conclusion was that, while there were some implementation problems in Study 2, they are surmountable. The experimental procedure was judged to have been successful in capturing the essential characteristics of demarketing problems.

This chapter also outlined some of the methodological problems encountered in Study 2, and made suggestions for change. One recommendation was that future research using this experimental procedure should balance the number of pre-manipulation lists (which, based on the experience in this experiment, people invariably do one-sided) with the number of two-sided lists done in the manipulation.

A second recommendation concerning methodology was that future research should seek a better balance between the strength of the persuasive message and the strength of the behavioral reinforcement. One way to strengthen the persuasive message without drawing too much attention to it or having it be perceived as instructions might be to alter the experimental task and cover story slightly such that participants would view a series of persuasive messages, so that the persuasive message of interest could be delivered in a much more openly persuasive way, without drawing undue attention.

A third recommendation was that, in order to provide an opportunity for decay to occur, another distractor videotape (or other distracting activity) should be added, which would be followed by another series of lists.

A fourth recommendation of a methodological nature was further testing be done to determine what relative levels of behavioral reinforcement are necessary to overcome the effects of existing practice. In Study 2, the amount of behavioral reinforcement may have been inadequate.

Also discussed in this chapter were two issues of a more conceptual or theoretical nature. First, the data from Study 2 suggest that, in situations where people have not developed habits or habit-like behaviors, demarketing programs that can get people to act as if they had a higher level of involvement will be more effective than demarketing programs that do not. It is not clear that
engaging in two-sided list-making actually increased involvement; perhaps some "pseudo-involvement" (in which people act as if they are involved, but notice no increase in personal relevance) is acting. Investigating the role of involvement and/or pseudo-involvement is a task for future research.

The second theoretical issue concerns the role of motivation. Study 2 is a preliminary empirical exploration of some of the theory developed in Chapter 8 to explain how habitual or habit-like behavior changes. Although motivation plays a prominent role in the theory, this experiment did not attempt to manipulate it. Future research should.

In summary, then, Study 2 shows that habit-like behavior does not respond to change attempts in the same way that non-habit-like behavior does, which is one of the key points of this dissertation. It also raises some new and interesting questions. While some of the findings from this experiment do not coincide with expectations, there are explanations for each unexpected finding that are not inconsistent with the theory presented earlier in this dissertation. It would seem worthwhile to refine both the method and the theory, and to pursue further this research area.
CHAPTER 12
CONCLUSIONS

This chapter summarizes the dissertation research, discusses its implications and contributions, as well as its limitations, and outlines future research directions.

Summary of the Dissertation Research

This research has explored, from a marketing point of view, some issues concerning the question of how to reduce discretionary consumption. This is an issue that has received relatively little research attention, probably due to the fact that countries of the developed world, where most research has been conducted, have generally had economies in a state of excess supply. However, as the United Nations' World Commission on Environment and Development pointed out, global pressure on resources is becoming acute. The Commission recommended that a priority be put on sustainable development, which would require reductions in discretionary consumption of resources, particularly in the developed world, where per capita consumption is many times higher than it is in the developing world.

A review of the marketing literature revealed that, while the usual emphasis has been on issues related to increasing demand, some research has been done on decreasing demand. The term demarketing was coined in the early 1970s, in recognition of the fact that marketing is about more
The convergence between the Revolving Door Model and the habit reversal procedure can be taken as an indication that there is some understanding of the habit change process. However, while the P&D Revolving Door Model of Behavior Change describes what happens as habitual and habit-like behavior changes, and Azrin and Nunn's habit reversal procedure explains how to make it happen, neither approach explains why the habitual behavior change process happens as it does, nor why a procedure such as habit reversal might work. Such explanations might have more than theoretical value; they might suggest other techniques that might also be effective, even in other contexts. The remainder of this chapter is devoted to developing theory to explain why and how habitual and habit-like behavior changes, based on what is known about the characteristics of habitual and habit-like behavior.

Pre-Emptive Habitual and Habit-Like Behavior Change

Recall, from Chapter 3, that a habit is a pattern of activity that has, through extensive repetition, become automated, fixed, and effortless, and occurs without conscious awareness or consideration of alternatives (Definition 3.1), and habit-like behavior is a pattern of behavior that has been so well practised that its execution requires little or no attention (Definition 3.2). Habit-like behavior has a number of properties, one of which is that it is initiated by one or more "triggers" — stimuli that activate the automated processes that characterize habit-like behavior. It stands to reason that if the trigger(s) can be removed, the habitual or habit-like behavior would not occur, as Proposition 8.1 indicates.

Proposition 8.1
Inhibition of the trigger(s) that initiate a habitual or habit-like behavior will prevent the performance of that habitual or habit-like behavior.

Inhibiting the trigger(s) of a habitual or habit-like behavior would have two requirements. First, it would be necessary to identify the trigger(s). There may be multiple triggers for a single habitual or habit-like behavior in a single individual, any one of which could elicit the behavior. For
instance, someone who needs and wants to reduce the amount of fat in his or her diet might, despite intentions to the contrary, be triggered to eat ice cream by boredom, or loneliness, or the need to pamper him- or herself. In addition, the trigger(s) may vary from one person to the next. For instance, another person, also intending to cut down on dietary fat might be triggered to eat ice cream by seeing an ice cream store on a hot day, or by the fact that it is time for dessert and "we always have ice cream for dessert."

Since a single individual may be triggered to perform a habit or habit-like behavior by more than one stimulus, and since different individuals may be triggered by different stimuli, successful inhibition of a trigger-inhibition strategy would need, at minimum, the ability to identify and target segments based on trigger. For many habitual and habit-like behaviors, individual and individualized attention would be desirable to implement the inhibition strategy successfully. Such opportunities are likely to be scarce, especially for demarketers, who often do not have direct and personal access to the people whose behavior they are attempting to change.

Identifying the trigger(s) would not, by itself, be sufficient to prevent instances of the habitual or habit-like behavior. The second requirement for inhibition of the habitual or habit-like behavior is gaining control of the trigger. This would often be difficult. For instance, low blood sugar is often a trigger for eating sugary food high in fat. Demarketing dietary fat might therefore involve helping people avoid low blood sugar, but since different people have different metabolisms and different eating habits, a different strategy would be desirable for each person, for maximum effectiveness. The delivery of such idiosyncratic strategies would usually be impractical.

Even if the difficulties associated with identifying and controlling the trigger(s) could be overcome, the pre-emptive approach has a significant flaw: it only prevents the performance of the habit or habit-like behavior; it does nothing to change it. Should the circumstances that allow control over the trigger(s) change, people would likely revert to the habitual or habit-like behavior, because
nothing has been done to inhibit the causal relationship between trigger and habit, *unless* the trigger-habit connection requires regular reinforcement to maintain its strength.

The preceding arguments suggest that the pre-emptive approach to changing habits (i.e., changing habitual and habit-like behavior by preventing exposure to stimuli that trigger such behaviors) is, in most cases, neither practical for demarketing nor particularly desirable. The next section examines a different approach to the habit change problem.

**Decomposing the Habit Change Problem**

Earlier chapters of this dissertation have made a distinction between volitional and habitual behavior. Volitional behavior is the result of conscious choice, while a habit is a pattern of activity that has, through extensive repetition, become automated, fixed, and effortless, and occurs without conscious awareness or consideration of alternatives (Definition 3.1). Although changing volitional behavior is not necessarily easy, it is relatively well understood by social psychologists. The same cannot be said for habitual behavior. Given the remarkable efficiency and flexibility of human cognitive systems, though, it seems unlikely that the two kinds of behavior change are completely separate. Rather, it is probable that there are overlaps between the two. It is therefore proposed here that every successful habit change includes volitional behavior change. (Note that this does not imply that every volitional behavior change is a part of a larger habit change.) It is further proposed that the volitional behavior change portion of the habit change is preceded by a process of *de-automation*, and followed by a process of *consolidation*. The former process brings the habit to conscious awareness and under conscious control, so that volitional behavior change is possible, while the latter process automates the new behavior so that, once again, it can be performed without demanding too many cognitive resources. Once this progression, shown in Figure 8-1, is understood, the habitual behavior change problem, and hence the demarketing problem, becomes more tractable.
Hence, Proposition 8.2:

**Proposition 8.2**
Successful habit change involves three components, which always occur in the same order. First, the individual must become aware of specific occurrences of the habit and bring it under conscious control. Then, volitional behavior change can occur. If the change is to persist, the new behavior must be automated.

**Corollary**
If the new behavior is not automated, it will be extinguished, and the original habit will re-assert itself.

**De-Automation**

Since habits and habit-like behaviors are relatively automated processes that run without awareness or conscious control, the first step in changing such behaviors is to bring them under conscious control (Definition 8.1).

**Definition 8.1**
*De-automation* is the process of bringing under conscious control the automated processes that underlie habit-like behaviors.

Both bringing and keeping the habit under conscious control can be difficult, even under the best of circumstances. Even people who are truly determined to change a habit often find it difficult to do so. And demarketers face an even more difficult task. Lacking control over the people whose behavior they seek to change, demarketers have to persuade them to bring certain of their own habitual and habit-like behaviors under conscious control.

It is proposed below that de-automation requires that people know precisely what behavior(s) to change, that they can reliably anticipate the performance of the behavior(s), and that they have enough motivation to invest the cognitive energy necessary to bring the habit under conscious control.
Before developing those propositions, however, it is necessary to make explicit a key assumption about the relationship between automated processes and habit-like behaviors.

**Automated processes and habit-like behaviors.** As Chapter 3 explained, habits and habit-like behaviors are the results of automated processes. This notion is formalized in Assumption 8.1:

**Assumption 8.1**

Habits and habit-like behaviors are the results of automated processes.

Consider, for instance, a university student taking notes in class. For most undergraduate students, note-taking is clearly a habit-like behavior. It is likely made up of several automated processes, such as: one to pick out cues that indicate which points are more important, one to organize the notes (e.g., using headings, under which each related point appears on a new line), one to actually do the writing, and one to keep track of what other people in the class are doing, as illustrated in Figure 8-2. None of these automated processes requires attention; the student pays attention to the content of the class.

**Figure 8-2**

Relationship Between Automated Processes and Habit-Like Behaviors

![Diagram showing the relationship between automated processes (AP1, AP2, AP3, ..., APj, ..., APn) and habit-like behavior (H1).](image)

It is also assumed in this research that the automated processes that combine to form a relatively complex habit-like behavior such as note-taking are themselves combinations of lower-level automated processes. For instance, writing is an automated process used in note-taking, but writing itself is made up of several automated processes, such as: one for the formation of each individual
letter, one to connect the letters, one to spell, one to separate letters in one word from letters in another, and so on. Hence Assumption 8.2:

**Assumption 8.2**
The automated processes that combine to form a habit-like behavior are themselves combinations of lower-level automated processes.

It is further assumed that, in the hierarchy of automated processes and habit-like behaviors, a given automated process at one level is not necessarily dedicated to a single automated process or habit-like behavior at a higher level. Returning to the note-taking student, writing is one of the automated processes making up the note-taking habit, but it may also be an automated process making up a different habit, such as writing letters home. Hence Assumption 8.3:

**Assumption 8.3**
Any automated process may be a constituent process in an automated process or habit-like behavior at a higher level of organization.

Expressing Assumption 8.1 to 8.3 graphically, Figure 8-3 illustrates possible relationships among habit-like behaviors and automated processes at various levels of complexity.

**Figure 8-3**
Hierarchy of Automated Processes and Habit-Like Behaviors

![Diagram](image)

**Description.** Given Assumption 8.1, that habit-like behaviors are the results of automated processes, it follows that changing the habit-like behavior requires control over the constituent automated processes. In order to gain control over those processes, it is necessary to know exactly
which processes are involved. For instance, because the note-taking habit is made up of several automated processes, merely telling the student to "take better notes" would be of limited value. The student needs to know what exactly the problem is. Does he or she focus on the wrong points, or is the problem slow writing? Similarly, in a demarketing context, exhortations to "save energy" or even "turn off unnecessary lights" are too vague. There are other, related problems.

In some cases, people may want and intend to change their behavior, but doing so may require changes in specific habits that are so ingrained that they may not even realize that they have them. For instance, the irony of a student newspaper editorial arguing against logging is lost on its authors. They are devoted to using their persuasive skills to saving trees but use a medium that destroys them, even though other options are available.

Alternatively, the behavior change may require changing habits people are aware they have but do not realize are related to the intended behavior change. For instance, someone might know that he or she eats eggs for breakfast every day, but not realize that that habit is inconsistent with reducing dietary fat. It should therefore be a priority for demarketeters to describe exactly what habits or habit-like behaviors that they want people to change.

Hence Proposition 8.3:

**Proposition 8.3**
To change a habit-like behavior, an individual needs a specific and detailed description of the habit-like behavior and relevant underlying automated processes. This is a necessary but not sufficient condition for change.

Consider, for instance, a demarketing program designed to reduce energy consumption by persuading people not to use electrical devices unnecessarily. For the program to achieve maximum effectiveness, people need to be told exactly what that means. They need to know what electrical devices the request refers to, what use would be classified as necessary (as opposed to unnecessary), and what specific behaviors (including, where possible, triggers) they should change. Such a demarketing program might, for example, point out that many people walk into their offices and
reflexively turn on the overhead lights even though there is plenty of light from the window. Without an explicit description like this, people who sincerely want to reduce their consumption of energy might not even notice that opportunity, simply because walking into their offices and turning on the lights is an automated process and therefore not subject to conscious awareness. A specific, detailed description of the habit-like behavior and its relevant underlying automated processes can bring them to conscious awareness.

The requirement for a detailed description of the specifics of the habit-like behavior change places a heavy burden on demarketers, as it requires cataloguing the habit-like behavior, including its underlying automated processes and their triggers. Accomplishing this may be complicated because a single habit-like behavior (e.g., turning on a light) can be the result of different automated process (e.g., walking into the room, starting to read something that requires concentration), each triggered by a different stimulus. Communicating the complete catalog of underlying automated processes is likely to be impractical for most demarketers, so typical examples of behavior should be identified and communicated.

Given the preceding discussion, it is not surprising that, in their explication of the habit-reversal method they developed for overcoming nervous habits and tics, Azrin and Nunn (1973) emphasize that the first step is for the client "to describe the details of the movement to the counsellor, using a mirror, if necessary, while [re-enacting] several instances of the typical movement" (Azrin and Nunn 1973: 622). Note that having the client describe the habit to the counsellor ensures that the client really does know what the habit is, and is therefore superior to communication in the other direction, but the latter option is the one most usually available to demarketers.

**Reliable anticipation.** Another condition for successful de-automation is the ability to reliably anticipate performance of the habit-like behavior that is at issue. Since habit-like behaviors are complexes of automated processes, and automated processes are triggered by certain stimuli, it
should really be necessary only to anticipate the appearance of the triggering stimuli. There is plenty of anecdotal evidence to indicate that anticipation of habitual and habit-like behaviors is often difficult. In trying to break habits, people frequently complain that they have already performed the behavior before they even notice it, such as a dieter who suddenly realizes that he or she is halfway through a chocolate bar. Hence Proposition 8.4:

**Proposition 8.4**
To change a habit-like behavior, an individual needs to be able to reliably anticipate its performance. This is a necessary but not sufficient condition.

**Corollary**
Since a habit-like behavior’s underlying automated processes are triggered by certain stimuli, its reliable anticipation amounts to reliable anticipation of the triggering stimuli.

It is therefore important that the description of the habit-like behavior include the triggers. If people are aware that a particular stimulus triggers the habit-like behavior they are trying to change, it may be possible for them to avoid the trigger, and thereby prevent the performance of the habit-like behavior. For instance, if the trigger to turning up the thermostat is feeling cold, then wearing warmer clothes may prevent unnecessary consumption of energy.

As well, situations in which the trigger is likely to arise should be described, so that, if possible, they can be avoided. For instance, if mid-afternoon hunger pangs are the trigger for someone to eat a chocolate bar at work, then eating a larger lunch or bringing a healthier snack to eat before the hunger pangs usually arise may prevent the hunger pangs that trigger the consumption of an unnecessary chocolate bar.

Azrin and Nunn (1973), in their habit-reversal procedure, recommend that people trying to overcome nervous habits and tics be given practice in detecting the earliest sign of a habit movement, and that they learn to become aware of situations in which the habit is likely to occur by having the person "recall all situations, persons, and places where the habit was likely to occur and having him describe how the habit was performed in each of those situations" (Azrin and Nunn 1973: 623).
Motivation. Both P&D (e.g., Prochaska and DiClemente 1984) and Azrin and Nunn (1973) emphasize the importance of motivation in changing habitual and habit-like behavior. Change is, according to these researchers’ experience, unlikely to occur unless there is considerably more than a casual interest in the change. However, neither team of researchers provides an explanation for their conclusion.

From the cognitive point of view adopted in this dissertation research, the need for motivation can be explained as a result of scarcity of cognitive resources. Kahneman (1973) points out that humans have limited processing capacity. When there is competition for processing capacity, it is likely that if something can run automatically, it will, because automatic processing does not use attentional capacity, so attention can be directed elsewhere. The tendency to use automated processes can be overridden — if the motivation to override automation is great enough. Hence Proposition 8.5:

**Proposition 8.5**
To change a habit-like behavior, an individual must have enough motivation to override the underlying automated processes. This is a necessary but not sufficient condition.

Motivation to override the underlying automated processes would occur if the person becomes convinced that the problem has personal relevance (Janis and Mann 1977, Ronis, Yates and Kirsch 1989). This could be done either by increasing the importance of the advantages associated with changing the habit-like behavior or increasing the importance of the disadvantages associated with not changing the habit-like behavior. Depending on the degree of automation, it may be enough to draw attention to the problem, and make suggestions for behavior change; or it may be necessary to manipulate the consequences of the habit-like behavior so that they are intense enough to attract attention. In the domain of energy conservation, for example, purchasing behavior is likely to be less automated than actual consumption behavior: it is easier to get people to pay attention to what kind of light bulb they are buying than to how often they switch it on and off.
In summary, then, de-automation is the first step in changing habitual and habit-like behavior. Since such behavior is a complex of automated processes, it can be difficult to overcome. A cognitive analysis of the problem suggests that people need a specific and detailed description of the habit-like behavior and its underlying automated processes, including the triggering stimuli, and they need to be able to anticipate when such triggers are likely to occur. Finally, they need to be motivated to make the effort to overcome the automation so that volitional behavior change can occur.

Volitional Behavior Change: The Fishbein and Ajzen Approach

Once de-automation has been achieved, and the relevant behaviors are under conscious control, then the problem of changing habit-like behavior reverts to the traditional behavior change problem that social psychologists have been working on for years.

Although various credible volitional behavior change theories exist, the Fishbein and Ajzen (1975) Theory of Reasoned Action is one of the more widely accepted. This theory posits that behavior (B) is determined by a person's intention to perform it (I), and the more specific the intention, the more likely it is to be an accurate predictor of behavior.

Intentions are, in turn, determined by the person's attitudes (i.e., general feeling of favorableness or unfavorableness) toward the behavior (A), as well as by the associated subjective norm (i.e., the person's perception that people important to him or her think he or she should or should not perform the behavior in question) (SN). The relative importance of the individual's attitude and subjective norm (w₁ and w₂ respectively) may vary across behaviors and individuals\(^\text{12}\).

Expressed mathematically, the theory at this level is:

\[
B \sim I = (A)w₁ + (SN)w₂
\]

\(^{12}w₁ and w₂ are empirically determined, and may be influenced by variations in behavior, object, situation, and time, as well as by individual difference variables. Their relative influence may also be affected by behavior change strategies.\)
Both the attitude and the subjective norm components of the theory can be further analyzed. A person’s attitude toward the behavior is determined by his or her salient beliefs about it, and can be estimated by summing the products of the individual’s evaluation of each of the behavior’s consequences \(e_i\) and the strength of his or her belief that performing the behavior will lead to that consequence \(b_i\):

\[ A_b = \sum b_i e_i \]

The relative influence of each belief will be determined by one’s evaluations of each of those consequences.

Similarly, the subjective norm is determined by the perceived expectations of specific referent individuals or groups \(b_j\) and by the person’s motivation to comply with those expectations \(m_j\):

\[ SN = \sum b_j m_j \]

According to the Fishbein and Ajzen theory, any attempt to induce behavior change must always be directed at one or more of the individual’s beliefs. Beliefs can be influenced two ways, by active participation and by persuasive communications. In active participation, a person is placed in a situation where he or she can personally observe that a behavior has a particular consequence. Assuming that the person actually perceives the behavior-consequence association, this is a powerful behavior change strategy, as people rarely doubt information received through their own senses (i.e., \(e_i\) will be high). Unfortunately, it is frequently impractical to arrange for people to experience or observe personally the behavior-consequence relationship. In such cases, persuasive communications can be used — the person is told that the behavior in question has a particular consequence. With persuasive communications, the major problem is to ensure that the person believes the communication linking the behavior and the consequence (i.e., the danger is that \(e_i\) will be low).
The Theory of Reasoned Action in a Demarketing Context

The kind of behavior change sought in demarketing, reduction in excessive discretionary consumption, can be difficult to get, even when de-automation has been successful. Part of the reason is that the behavior change process is complex, with many intervening processes, each of which is likely to dilute the potential effect. As Figure 8-4 shows, changes in beliefs affect attitudes and/or subjective norms, which, in turn, affect behavioral intentions. Finally, behavioral intentions influence behavior. The effect of a change in any given belief is therefore likely to be small.

Figure 8-4
Overview of the Theory of Reasoned Action

| BELIEFS → ATTITUDES AND SUBJECTIVE NORMS → INTENTIONS → BEHAVIOR |

Another part of the reason for the difficulty in getting reductions in consumption is that demarketing asks people to give up something desirable for a set of benefits that are not well-defined, as outlined in Table 3-1. Consequently, demarketing strategies have to rely mostly on persuasive communications, which are generally less effective than the alternative, active participation.

In spite of these obstacles, though, many people do decide to try to consume less: they go on diets, they cut down on passive diversions like television viewing, they turn down the thermostat, they decline to take a bag when they make a purchase. If this were a typical marketing problem, such progress might be perceived as success, and rightly so. Often the biggest problem in conventional marketing situations is to convince potential users to try the product; once they have sampled it, they are likely to continue using it, because most products satisfy some immediate need. In the case of demarketing, however, sampling the "product" is not likely to induce repeated use, because the benefits are not immediately evident, and because of the habit-like nature of the consumption behavior.

Recall that the reason for automation in cognitive and other processes is that cognitive resources are limited and automation permits processes to run in parallel, rather than serially. This
capacity constraint remains. It is therefore unlikely that adequate resources will be consistently available to permit the "reasoned action" proposed by volitional behavior theories, particularly when the benefits of behavior change are unclear, as they often are in demarketing situations. Consequently, in instances when there is competition for controlled processing capacity, there is likely to be reversion to the habit-like behavior. People go off their diets, they gradually resume their usual television viewing habits, they forget to turn down the thermostat, and they don’t notice until it is too late that they have been given an unnecessary bag with their purchase.

Since it is clearly impractical to expect that people will be willing or able to make a conscious decision to consume less every time there is an opportunity to do so, the new behavior must be automated and the old habit extinguished. In other words, the bad habit must be replaced with a good habit.

Consolidation

The final step in changing habit-like behaviors is to consolidate the new behavior so that it becomes habit-like. Automating the new behavior may be where demarketing has tended to fall apart. Marketing programs are generally good at getting people to try to consume less — they go on diets, they watch less television, they turn off lights — but somehow, in many people, these behavior changes never seem to get beyond the novelty stage. If the new behavior is not consolidated (see Definition 8.2), the gains achieved in de-automation and volitional behavior change are quickly extinguished.

**Definition 8.2**

*Consolidation* involves repetition of the new behavior until it has become so well-practised (i.e., automated) that there is no advantage in terms of cognitive resource use to reverting to the old habitual behavior.

In order to foster consolidation, demarketers must provide people with both the motivation and the means to engage in volitional behavior change many times, preferably in a variety of settings.
In other words, they have to make it worth people's while to override their natural inclination to consume excessively, until the new style of consumption is habit-like, at which time it will not require attention, or conscious awareness, and, once triggered, will run to completion.

The process of consolidation will be affected not only by repetition itself, but by the information generated by each repetition of the act. This information will affect the belief structure that ultimately drives the volitional behavior. For instance, as a dieter becomes accustomed to eating less, hunger pangs may subside, so the belief that eating less causes discomfort will be changed. Conversely, if someone carefully turns off unnecessary lights but sees only a minimal change in the electric bill, then his or her beliefs about the economic value of energy conservation will be changed negatively. Demarketers must therefore, where possible, ensure that when people make the effort to consume less, their belief structure is altered in a way that makes future volitional acts more likely.

Only when the new pattern of behavior has become habit-like and the old pattern of behavior has been extinguished can the habitual behavior change be said to be complete. Each of the three components of habitual behavior change, de-automation, volitional behavior change, and consolidation — must operate for effective demarketing.

Relationships Among the Components of Habitual Behavior Change

The three components of habitual behavior change operate consecutively, but also iteratively. Cognitive resources are sufficiently scarce and the environment sufficiently complex and challenging that it is almost certain that people will revert occasionally or frequently to the old behavior patterns, despite their best intentions. In situations where there is competition for processing resources, anything that can be processed in parallel using minimal resources will be. Thus it is the rule rather than the exception to observe lapses among people seeking to reduce their consumption. They go off their diets, and sometimes they just forget that they intended to insist on less packaging.
An Additional Complication

In addition to the challenges inherent in each of the component processes, there is another potential complication. Since the habitual behavior change process is actually a sequence of three distinct components, operating differently, to different purposes, it is not inconceivable that they may sometimes act to counterpurposes. In other words, the same item of persuasive content may work well for people in one component, but may actually be detrimental if used for people in another component. For instance, dramatic information may be useful in de-automation and even volitional behavior change, because it attracts attention, but when consolidation is happening, dramatic new information, even if it is supportive, is disruptive. An example of this complication sometimes occurs in weight loss. Some people lose a lot of weight quickly when they go on an extreme diet, such as a liquid diet, but that kind of weight loss and that style of eating are not maintainable for long. Many of these people then regain the lost weight because they have no maintainable skills to consolidate.

Summary

This chapter began with a brief review of the psychology literature related to habit change that revealed that, while there are programs applicable to various specific habits or habit-like behaviors, there have been few attempts to gain a more general understanding of the underlying processes. The chapter then turned to developing theory on changing habits and habit-like behaviors, based on what is known about the nature of habits and habit-like behavior (reviewed in Chapter 3). It was proposed that changing habit-like behavior proceeds in three steps: de-automation, volitional behavior change, and consolidation. Explanations from a cognitive psychology point of view were offered for each component of the proposed habit-change process.

The next chapter presents the hypotheses and design of a study that tests some of the theoretical concepts proposed here.
The thesis of this dissertation is that demarketing is not just a variation on the usual marketing problem, but a problem that is (1) more complex than the typical marketing problem, and (2) similar to the habit change problems studied in clinical psychology. In other words, marketing is like asking consumers to develop new, "good" habits; while demarketing is like asking consumers to change existing "bad" habits; and changing a bad habit is more difficult to do than developing a good habit.

Chapter 8 proposed that habit change proceeds in three steps: de-automation of the old habit-like behavior, volitional change of that behavior, and consolidation of the new behavior. This chapter develops hypotheses and describes the design of a study that allows two approaches to demarketing excessive discretionary consumption — i.e., wasteful behavior — to compete directly. The first approach is a persuasion-based "traditional marketing" approach, and the second is a behavior-based "habit change" approach, as proposed in Chapter 8. Each is tested in two situations: when the wasteful behavior is new; and when the wasteful behavior is well-entrenched, and has become habit-like. It is expected that if the wasteful consumption behavior and/or the consumption situation is relatively new (i.e., not yet habit-like), then persuasion-based behavior change strategies will work just as well as behavior-based change strategies. However, if the wasteful consumption behavior and/or the consumption situation has become habit-like, then persuasion-based strategies will not
achieve reductions in consumption; behavior-based strategies will be more effective, though they may be subject to decay.

Hypotheses

The hypotheses are stated here in general terms; operational versions of the hypotheses are presented after the study has been described in more detail.

There are three sets of hypotheses. The first set (1A, 1B, and 1C) concerns behavior change when a behavior has not been repeated extensively enough to be considered habit-like. Under these circumstances, both persuasion-based and habit-based strategies should be effective in changing behavior (1A and 1B). However, the reinforcement provided by the behavioral reinforcement in the persuasion-plus-behavior should be more effective in sustaining behavior change (1C). These hypotheses are not the central concern of the dissertation. They merely reiterate the predictions of the Theory of Reasoned Action (1A) and those of learning theory (1B and 1C). They are presented to demonstrate that the experimental procedure produces expected results for volitional behavior (i.e., behavior that is the result of a conscious decision), so that the results produced by the same procedure for habit-like behavior can be attributed solely to the difference between the two types of behavior.

The following hypotheses assume that there is an undesirable current behavior and a desirable alternative behavior that accomplishes the same terminal goal for the consumer (where resource use is instrumental to that terminal goal). Then:

Hypothesis 1A
If the undesirable behavior has not been extensively repeated (i.e., has not become habit-like), then a persuasive message that produces (or activates) a (more) positive attitude toward the desirable behavior will induce the desirable behavior in the post-manipulation period.
Hypothesis 1B
If the undesirable behavior has not been extensively repeated (i.e., has not become habit-like), then a manipulation that both induces (or activates) a (more) positive attitude toward the desirable behavior and reinforces the positive attitude through limited practice of the desirable behavior will induce the desirable behavior in the post-manipulation period.

Hypothesis 1C
If the undesirable behavior has not been extensively repeated (i.e., has not become habit-like), then as experience with the situation accumulates, the behavior change induced by a manipulation that both induces (or activates) a (more) positive attitude toward the desirable behavior and reinforces the positive attitude through limited practice of the desirable behavior will be sustained better than the behavior change induced by a persuasive message that produces (or activates) a (more) positive attitude toward the desirable behavior.

In other words, if the consumption behavior and/or the consumption situation is relatively new, consumption is still volitional, so in the period immediately following the manipulation, traditional behavior change strategies based on persuasion to change attitudes should work (1A) just as well as behavior change strategies based on habit change strategies (1B). Repeated post-manipulation exposure to the situation should generate habit-like behavior, so the habit-based strategies are predicted to have a superior effect.

The second set of hypotheses (2A, 2B, 2C, and 2D) concerns behavior change when a behavior has been repeated extensively enough to be considered habit-like. When consumption has become habit-like, merely using a persuasive message to change attitudes should be relatively ineffective (2A), since the theory driving such strategies assumes volitional behavior. In contrast, reinforcing positive attitudes with limited practice (the habit-based strategy) should be effective in achieving behavior change (2B), although interference from the habit-like undesirable behavior is likely to cause some decay in the incidence of the desirable behavior (2C). However, even taking into account this decay, the habit-based strategy should be more effective than the attitude-only strategy (2D). These hypotheses are the central concern of the study.
As with the first set, this second set of hypotheses assumes that there is an undesirable current behavior and a desirable alternative behavior that accomplishes the same terminal goal for the consumer (where resource use is instrumental to that terminal goal). Then:

**Hypothesis 2A**
If the undesirable behavior has been extensively repeated (i.e., has become habit-like), then a persuasive message that produces (or activates) a (more) positive attitude toward the desirable behavior will not induce the desirable behavior in the post-manipulation period.

**Hypothesis 2B**
If the undesirable behavior has been extensively repeated (i.e., has become habit-like), then a manipulation that both induces (or activates) a (more) positive attitude toward the desirable behavior and reinforces the positive attitude through limited practice of the desirable behavior will induce the desirable behavior in the post-manipulation period.

**Hypothesis 2C**
If the undesirable behavior has been extensively repeated (i.e., has become habit-like), then as experience with the situation accumulates, behavior change induced by a manipulation that both induces (or activates) a (more) positive attitude toward the desirable behavior and reinforces the positive attitude through limited practice of the desirable behavior will exhibit some decay.

**Hypothesis 2D**
If the undesirable behavior has been extensively repeated (i.e., has become habit-like), then as experience with the situation accumulates, behavior change induced by a manipulation that both induces (or activates) a (more) positive attitude toward the desirable behavior and reinforces the positive attitude through limited practice of the desirable behavior will be greater than behavior change (if any) following a manipulation that produces (or activates) a (more) positive attitude toward the desirable behavior.

In other words, once consumption has become "habitually" excessive, persuasion-based strategies will not achieve reductions in consumption. Instead, strategies that are based on habit-change should be more effective, though they may be subject to decay.

The third set of hypotheses concerns the relative effectiveness of a persuasive message alone (the traditional marketing approach) and the persuasive message reinforced by limited practice of the
desirable behavior (the habit-change approach) depending on whether the undesirable behavior had been practised enough to become habit-like.

If the undesirable behavior has been practised so much that it has become habit-like, then changing that behavior should require more than just a persuasive message; behavioral reinforcement should also be necessary (3A). On the other hand, if the undesirable behavior has not been practised enough to have become habit-like, then a persuasive message alone should be enough to effect behavior change. Reinforcing the persuasive message with behavior would be unnecessary overkill (3B).

Again, this third set of hypotheses assumes that there is an undesirable current behavior and a desirable alternative behavior that accomplishes the same terminal goal for the consumer (where resource use is instrumental to that terminal goal). Then:

**Hypothesis 3A**
A manipulation that merely induces (or activates) a (more) positive attitude toward the desirable behavior will be less effective if the undesirable behavior has been extensively repeated (i.e., has become habit-like) than if the undesirable behavior has not been extensively repeated.

**Hypothesis 3B**
A manipulation that both induces positive attitudes toward the desirable behavior and reinforces that behavior with limited practice will be equally effective whether or not the undesirable behavior has been extensively repeated (i.e., has become habit-like).

**Methodological Approach**

The survey in Study 1 had given some indication that a habit-based model, the Revolving Model of Behavior Change, provides a reasonable description of changes that occur in a consumption situation typical of those demarketing programs seek to change, energy conservation. Exploring further the connection between demarketing and habit-like behavior called for a more controlled study. The data for this study were therefore collected in a laboratory experiment. The experimental
situation was designed to simulate the critical aspects of demarketing problems, while controlling, as much as possible, for the effects of other variables, thereby increasing internal validity.

To summarize briefly, participants were asked to complete a task requiring the use of a resource. Their attention was focused on the task; the resource was just a means to an end. Their initial resource use was measured. Then the manipulations were delivered. Participants were exposed either to a persuasive message urging them to reduce their consumption of the resource (the traditional marketing approach) or to the same persuasive message reinforced with limited practice of the desired conservation behavior (the habit-change approach). Participants’ post-manipulation consumption of the resource was measured.

Criteria for the Target Behavior

Participants in the experiment were led to believe that they were involved in a study on how the organization of requests for information affects memory for that information. The actual variable of interest, however, was their consumption of paper in the completion of the memory task. This consumption behavior possesses many of the key characteristics of behaviors that are the focus of demarketing problems.

First, in many discretionary consumption situations, people become accustomed to using the resource wastefully. While there may originally have been good reasons for using the resources wastefully, those good reasons have become obsolete (at least from the demarketer’s point of view). In this experiment, participants quickly became used to using only one side of the paper, rather than both sides.

Second, in many discretionary consumption situations, the resource is not of central concern to the participant; it is merely a means to an end. In fact, it may be taken completely for granted. For example, most people do not think about how much energy they are using when they turn up their thermostats a few degrees; they just want to get warm. In this experiment, a cover story was
used to lead participants to believe that they were involved in a study of how the organization of requests for information affects memory for that information; the paper was just a resource they needed to complete the tasks assigned.

Third, in many discretionary consumption situations, changing the behavior is costly, though not necessarily in financial terms. For example, keeping the house a few degrees cooler than usual is not as comfortable. In this experiment, participants were under some time pressure, they were instructed to keep their work organized chronologically, and they knew that they would have to be able to locate specific lists quickly; this was not as easy to do when two sides of the paper are used instead of one.

Fourth, in many discretionary consumption situations, changing the behavior often has uncertain returns that will accrue far in the future, frequently to people other than those making the effort. For example, keeping the house a few degrees cooler means that people are uncomfortable now so that their descendants may be less uncomfortable in the future. In this experiment, there was no clear benefit (with respect to the task being performed) to using two sides of the paper, other than it was the "right" thing to do.

Finally, in many discretionary consumption situations, the reasons for changing the behavior are not immediately evident. For example, there are so many rivers in B.C. that could accommodate hydroelectric dams that many people have trouble believing that there is any need for British Columbians to conserve electricity. In this experiment, there was plenty of paper in full view; it was clear that there was no immediate danger of running out. The only reason participants would conserve paper is because it is the "right" thing to do.

**Overview of the Procedure**

After an introductory videotape that set up the cover story, the experiment proceeded in six steps: first, participants completed an initial set of lists; then, manipulations were delivered; after
that, there was a distraction; this was followed by the completion of another set of lists; a questionnaire was then filled out. Finally, participants were thoroughly debriefed by mail.

**Pre-manipulation lists.** In an initial set of trials (either a short set or a long set), participants made lists of items in various categories (e.g., countries in South America). They were instructed to put the number of the list in the upper left hand corner of the page and to keep the lists in order. After the lists were completed, participants were asked to place specific lists on the top of their pile of lists.

**Manipulations.** Within a videotaped lecture on network models of memory, participants received either a persuasive manipulation, a persuasion plus behavior manipulation, or no manipulation (Control).

**Distraction.** Participants were shown an interesting 10 minute videotape (an award-winning humorous cartoon documentary on home safety).

**Post-manipulation lists.** Participants were be asked to make lists of items in 30 categories. Again, they were instructed to put the number of the list in the upper left hand corner of the page and keep the lists in order. After the lists were completed, participants were asked to count the number of items in certain specific lists and record the count in the bottom left hand corner of the page on which the list appeared.

**Questionnaire.** Participants filled out a short questionnaire containing demographic and attitudinal information.

**Debriefing.** Participants were thoroughly debriefed in writing. Special attention was given to explaining the deception and why it was judged to be necessary.

**Design**

The design was simple. As Table 9-1 shows, each participant was to be randomly assigned to one of the six groups. Participants would receive either little premanipulation practice of making
one-sides lists (five lists) or extensive premanipulation practice (30 lists). Their base rate of resource use could thereby be measured. The manipulations were then delivered. A distraction was then provided, after which participants continued to make lists. Their post-manipulation rates of resource use could then be measured.

Table 10-1
Experimental Procedure and Design

<table>
<thead>
<tr>
<th>Little Pre-Manipulation Repetition of the Undesirable Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
</tr>
<tr>
<td>Persuasion</td>
</tr>
<tr>
<td>Persuasion + Behavior</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Extensive Pre-Manipulation Repetition of the Undesirable Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
</tr>
<tr>
<td>Persuasion</td>
</tr>
<tr>
<td>Persuasion + Behavior</td>
</tr>
</tbody>
</table>

The dependent variables concerned how successful the various manipulations were at inducing participants to use both sides of the paper.

Operational Hypotheses. Recall that the first set of hypotheses concerns the Little Pre-Manipulation Practice of the Undesirable Behavior groups. It was assumed that before the manipulations, all three treatment groups (Persuasion + Behavior, Persuasion, and Control) would be doing the tasks using only one side of the paper. Confirming this assumption required:

$A1a: \quad O_1 = O_4 = O_7 = 0$

$R$ refers to the randomization procedure;
$U_k$ refers to the amount of pre-manipulation practice of the undesirable behavior:
$k = 1$ for little premanipulation practice (five lists);
$k = 2$ for extensive premanipulation practice (30 lists);
$P$ refers to the persuasive manipulation;
$B$ refers to the behavioral reinforcement of the persuasive manipulation;
$O_n$ refers to the $n$th observation of the dependent variable; and
$Q$ refers to the administration of the questionnaire (attitude and demographic data).
Moreover, it was assumed that the task itself did not induce the desirable behavior. Confirming this assumption required:

\[ A1b: \quad O_7 = O_8 = O_9 = 0 \]

Recall Hypothesis 1A:

**Hypothesis 1A**
If the undesirable behavior has not been extensively repeated (i.e., has not become habit-like), then a persuasive message that produces (or activates) a (more) positive attitude toward the desirable behavior will induce the desirable behavior in the post-manipulation period.

The operational statement of this hypothesis is:

\[ H1a: \quad O_3 > O_2 \quad \text{and} \quad O_2 = 0 \]

Recall Hypothesis 1B:

**Hypothesis 1B**
If the undesirable behavior has not been extensively repeated (i.e., has not become habit-like), then a manipulation that both induces (or activates) a (more) positive attitude toward the desirable behavior and reinforces the positive attitude through limited practice of the desirable behavior will induce the desirable behavior in the post-manipulation period.

The operational statement of this hypothesis is:

\[ H1b: \quad O_8 > O_2 \quad \text{and} \quad O_2 = 0 \]

A stronger statement of \( H1b \) is:

\[ O_2 = O_3 \]

This states that attitude-based and habit-based strategies are equally effective in changing volitional behaviors.

Recall Hypothesis 1C:
Hypothesis 1C
If the undesirable behavior has not been extensively repeated (i.e., has not become habit-like), then as experience with the situation accumulates, the behavior change induced by a manipulation that both induces (or activates) a (more) positive attitude toward the desirable behavior and reinforces the positive attitude through limited practice of the desirable behavior will be sustained better than the behavior change induced by a persuasive message that produces (or activates) a (more) positive attitude toward the desirable behavior.

The operational statement of this hypothesis is:

\[ H1c: \ O_3 > O_6 \]

The second set of hypotheses concerns the High Pre-Manipulation Practice of the Undesirable Behavior groups. As with the first set of hypotheses, it was assumed that before manipulations, all three treatment groups (Persuasion + Behavior, Persuasion, and Control) would be doing the tasks using only one side of the paper. Confirming this assumption requires:

\[ A2a: \ O_{10} = O_{13} = O_{16} = 0 \]

Moreover, it was assumed that the task itself did not induce the desirable behavior. Confirming this assumption requires:

\[ A2b: \ O_{10} = O_{17} = O_{18} = 0 \]

Recall Hypothesis 2A:

Hypothesis 2A
If the undesirable behavior has been extensively repeated (i.e., has become habit-like), then a persuasive message that produces (or activates) a (more) positive attitude toward the desirable behavior will not induce the desirable behavior in the post-manipulation period.

The operational statement of this hypothesis is:

\[ H2a: \ O_{14} = O_{15} = 0 \]

Recall Hypothesis 2B:
Hypothesis 2B
If the undesirable behavior has been extensively repeated (i.e., has become habit-like), then a manipulation that both induces (or activates) a (more) positive attitude toward the desirable behavior and reinforces the positive attitude through limited practice of the desirable behavior will induce the desirable behavior in the post-manipulation period.

The operational statement of this hypothesis is:

\[ H2b: O_{i1} > 0 \]

Recall Hypothesis 2C:

Hypothesis 2C
If the undesirable behavior has been extensively repeated (i.e., has become habit-like), then as experience with the situation accumulates, behavior change induced by a manipulation that both induces (or activates) a (more) positive attitude toward the desirable behavior and reinforces the positive attitude through limited practice of the desirable behavior will exhibit some decay.

The operational statement of this hypothesis is:

\[ H2c: O_{i1} > O_{i2} \]

Recall Hypothesis 2D:

Hypothesis 2D
If the undesirable behavior has been extensively repeated (i.e., has become habit-like), then as experience with the situation accumulates, behavior change induced by a manipulation that both induces (or activates) a (more) positive attitude toward the desirable behavior and reinforces the positive attitude through limited practice of the desirable behavior will be greater than behavior change (if any) following a manipulation that produces (or activates) a (more) positive attitude toward the desirable behavior.

The operational statement of this hypothesis is:

\[ H2d: O_{i2} > O_{i3} \]

The third set of hypotheses concerned the relative effectiveness of persuasion alone versus persuasion with behavioral reinforcement depending on whether the undesirable behavior had been extensively practised.
Recall Hypothesis 3A:

**Hypothesis 3A**
A manipulation that merely induces positive attitudes toward the desirable behavior will be less effective if the undesirable behavior has been extensively repeated (i.e., has become habit-like) than if the undesirable behavior has not been extensively repeated.

The operational statement of this hypothesis is:

\[ H_{3a}: O_{14} < O_{5} \]

Recall Hypothesis 3B:

**Hypothesis 3B**
A manipulation that both induces positive attitudes toward the desirable behavior and reinforces that behavior with limited practice will be equally effective whether or not the undesirable behavior has been extensively repeated (i.e., has become habit-like).

The operational statement of this hypothesis is:

\[ H_{3b}: O_{4} = O_{17} \]

**Pretests**

Several pretests were done. Pretest 1 \((n = 5)\) confirmed that there was not an existing tendency to use both sides of the paper for the experimental lists. Pretest 1 participants made 20 lists without receiving any instructions on whether to use one or both sides. All Pretest 1 participants used one side of the paper.

Pretests 2 through 6 (total \(n = 26\)) were used to make sure the procedure ran smoothly. Several minor changes in procedure resulted.

**Procedure**

**Randomization.** The experiment was run in groups. Random assignment of participants to groups was achieved by listing the participants (who had signed up in advance) in alphabetical order, by surname and secondarily by given name(s), then assigning the first participant on the list to the
first group, the second to the second group, and so on through the groups until each participant has been assigned to a group.

**Preliminaries.** Each group met in a different room and all groups ran simultaneously. Participants in the Persuasion + Behavior groups each received an information sheet (see Appendix 2), a consent form (see Appendix 2), and four manila envelopes, clearly labelled 1, 2, 3, and 4. Participants in the Persuasion and Control groups each received an information sheet (see Appendix 2), a consent form (see Appendix 2), and three manila envelopes, clearly labelled 1, 2, and 3. In addition, each participant was supplied with a large pad of 3"x5" paper and a pen. Plenty of spare pads were available and prominently displayed at the front of the room (on the administrator’s desk).

At the beginning of the session, the administrator read through the information sheet with the participants and then asked the participants to sign the consent form. After the participants had a chance to do so, the administrator collected the signed consent forms.

After all the signed consent forms were collected, the administrator distributed the instruction sheet (see Appendix 2), and then read through it with the participants, who then had an opportunity to ask questions about the instructions before beginning the task.

**Pre-manipulation lists.** The administrator read out a randomly-ordered list of categories, numbered consecutively, at the rate of one every 30 seconds (see Appendix 2). As the administrator read each category, he/she projected it on a screen. (The list of categories were printed on overhead transparencies, and sequentially revealed as they were read.) Participants wrote the number of the category in the upper left hand corner of each page, and then listed items that fit into the category. The Little Pre-manipulation Repetition groups completed five lists (2.5 minutes); the Extensive Pre-manipulation Repetition groups did 30 lists (15 minutes). After every 10 lists, the administrator instructed participants to count the number of items in certain specific lists of that ten (e.g., 1, 6, 8) and record the number of items in the bottom left hand corner of the page on which the list appeared. (The purpose of this was to increase the perceived cost of changing to making lists on both sides of
the paper.) After all the lists had been completed, the administrator instructed participants insert the lists into envelope 1.

**Manipulations.** The manipulations were delivered via videotape. The script, with variations indicated for each condition, appears in Appendix 2. The videotapes were all made from a single master. Since the Persuasion + Behavior manipulation uses more words than the Persuasion manipulation, which itself uses more words than the Control, the Persuasion + Behavior version was taped as the master; appropriate deletions were made for the other two versions.

Participants watched the video. Participants in the Persuasion + Behavior groups also made 15 lists during the showing of the video, on paper on which the category names had been preprinted on both sides of the paper (i.e., Persuasion + Behavior participants made 15 lists during the video, using both sides of the paper). Persuasion + Behavior participants then inserted the 15 lists they had made during the showing of the video into envelope 2.

**Distraction.** To minimize the carryover of rote behavior and to determine whether the Persuasion and Persuasion + Behavior manipulations had been internalized enough to persist over a short interval, a distraction was provided. Participants watched a 10 minute award-winning, humorous animated documentary on an unrelated topic (household safety).

**Post-manipulation lists.** The administrator again read out categories at the rate of one every 30 seconds. In order to maintain consistency with the cover story, each post-manipulation category had some connection with the one before. See Appendix 2 for the list of post-manipulation categories. All participants made a total of 30 lists (15 minutes). Again, after every 10 lists, the administrator instructed participants to count and record the number of items in certain specific lists of that ten (e.g., 1, 6, 8). After all the lists were completed, the administrator instructed participants to all the lists into the envelope (envelope 3 for the Persuasion + Behavior participants, and envelope 2 for the Persuasion and Control participants).
Questionnaire. The administrator asked participants to complete the questionnaire (see Appendix 2), put it into the remaining envelope when they were finished.

Release. Participants were thanked for their participation and paid by the administrator.

Debriefing. Participants were thoroughly debriefed in a package mailed to their residences. The "process debriefing" technique was used, in which the experimental procedures are explained to participants thoroughly, including reasons for any deception.

Manipulations

It was important that the manipulations not be perceived by the participants as instructions that would carry over to the post-manipulation part of the session. All manipulations were delivered during the videotaped lecture. The lecture used 15 categories to explain how the network model of memory might work in the present situation. The first category was "Zoo animals;" the second, "Endangered species" and the third, "Environmental problems."

Persuasion + Behavior Manipulation. Participants were instructed to open envelope 3, in which they found 8 sheets of paper, with the 15 categories preprinted with one category on each side of each sheet. The person appearing in the video instructed participants to make the lists referred to. On the third category, the demonstrator said, "That reminds me . . . We use a lot of paper in this study, since we have to have each list on a separate page. If you use both sides of the paper, that would save some paper and some trees. Whether you use one side or two makes no difference to the study, but it would be good for the environment."

Persuasion Manipulation. Participants watched the video, but did not make lists. On the third category, the demonstrator said, "That reminds me . . . We use a lot of paper in this study, since we have to have each list on a separate page. If you use both sides of the paper, that would save some paper and some trees. Whether you use one side or two makes no difference to the study, but it would be good for the environment."
Control. Participants watched the video, but the person appearing in the video neither instructed participants to make lists, nor did she say anything about the use of paper in this study.

Sample

Student participants were recruited from the Faculty of Business at Memorial University of Newfoundland. The experimenter visited class meetings for required courses in all classes, inviting participation and handing around signup sheets. Reminder posters were put up the day before and the day of the experiment.

Participation was voluntary and occurred outside of class time, during a university-wide no-class period. Each participant was paid $5.00 per hour. Participation was anonymous and confidential, in the sense that there was no way to match the data with the individual supplying it.

A total of approximately 175 students signed up to participate in the experiment. Based on experience with pretests, a 25 to 30 percent dropoff rate was expected. In fact, 117 (67%) of the students who signed up to participate actually presented themselves at the appointed place and time.
CHAPTER 10
STUDY 2: ANALYSIS AND RESULTS

Recall that in Study 2, each participant was randomly assigned to either a control group or one of four treatment groups. Participants practised a task (making lists) either a little (five lists) or extensively (30 lists), using a resource (paper) wastefully (by using only one side). Participants were led to believe that the variable of interest was how long and interesting their lists were. Then participants saw a videotape concerning the task, in which the manipulations were inserted for the four treatment groups. Treatment participants were encouraged, either in a persuasive message, or in a persuasive message that was reinforced through limited practice, to complete the task using less of the resource (by using both sides of the paper rather than just one side). Participants then continued with the task (for 30 more lists).

Each participant’s resource use was observed at three points during the experiment: once after the initial set of practice trials; and twice after the manipulations, once immediately following the manipulation (the first ten lists post-manipulation) and once after some time had elapsed (the final ten of 30 lists post-manipulation). The dependent variable was the number of times participants used both sides of the paper in the set of lists being observed.

The procedure and design are represented symbolically in Table 10-1:
### Table 10-1
Experimental Procedure and Design\(^4\)

<table>
<thead>
<tr>
<th>Experimental Repetition of the Undesirable Behavior</th>
<th>Control</th>
<th>Persuasion</th>
<th>Persuasion + Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Little Pre-Manipulation Repetition</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td>$R$</td>
<td>$U_1$</td>
<td>$O_1$</td>
</tr>
<tr>
<td><strong>Persuasion</strong></td>
<td>$R$</td>
<td>$U_1$</td>
<td>$O_4$ $P$</td>
</tr>
<tr>
<td><strong>Persuasion + Behavior</strong></td>
<td>$R$</td>
<td>$U_1$</td>
<td>$O_7$ $P$ $B$</td>
</tr>
</tbody>
</table>

| **Extensive Pre-Manipulation Repetition**           |         |            |                       |
| **Control**                                        | $R$     | $U_2$      | $O_{10}$              |
| **Persuasion**                                     | $R$     | $U_2$      | $O_{13}$ $P$         |
| **Persuasion + Behavior**                          | $R$     | $U_2$      | $O_{16}$ $P$ $B$    |

Since the dependent variable was the number of times participants used both sides of the paper in the set of lists being observed, $O_k$ reports, for each participant, the number of pieces of paper with lists on both sides, for a given set of trials. For instance, $O_1$ reports, for the five initial practice lists, the number of pieces of paper with lists on both sides. If a participant used only one side of the paper, then there would be no pieces of paper with lists on both sides, and the value of $O_1$ would be 0. If, however, the participant had consistently used both sides of the paper, then there would be two pieces of paper with lists on both sides, and one piece of paper with a list on one side, and the value of $O_1$ would be 2. Similarly, $O_2$ reports on the first ten lists after the videotape. If a participant used only one side of the paper for all ten lists, then there would be no pieces of paper with lists on both sides, and the value of $O_2$ would be 0; if the participant consistently used both sides of the paper, then there would be five pieces of paper with lists on both sides, and the value of $O_2$ would be 5; and if the

\(^4\)where: $R$ refers to the randomization procedure; $U_k$ refers to the amount of pre-manipulation practice of the undesirable behavior:

- $k = 1$ for little premanipulation practice (five lists),
- $k = 2$ for extensive premanipulation practice (30 lists); $P$ refers to the persuasive manipulation;
$B$ refers to the behavioral reinforcement of the persuasive manipulation; $O_n$ refers to the $n$th observation of the dependent variable; and $Q$ refers to the administration of the questionnaire (attitude and demographic data).
participant used both sides of the paper for some of the first ten lists after the videotape and only one side for other lists, then the value of $O_2$ would be greater than 0 and less than 5.

The possible range for $O_n$ therefore depended on the number of lists on which it is based. For the initial set of practice trials in the Little Pre-Manipulation Repetition groups, (i.e., $O_1$, $O_4$, and $O_9$), the possible range was between 0 and 2. For the initial set of practice trials in the Extensive Pre-Manipulation Repetition groups, (i.e., $O_{10}$, $O_{13}$, and $O_{16}$), the possible range was between 0 and 15. In all groups, the possible range for the first ten lists post-manipulation (i.e., $O_2$, $O_5$, $O_8$, $O_{11}$, $O_{14}$, and $O_{17}$) was 0 to 5, as it was in the final ten of 30 lists post-manipulation (i.e., $O_3$, $O_6$, $O_9$, $O_{12}$, $O_{15}$, and $O_{18}$).

**Overview of the Data**

In order to provide a quick overview of the data, the design and procedure schematic is reproduced in Table 10-2, with the means of each observation added. Note that the design called for six groups (two control and four treatment groups) but, given the number of volunteers available, it was judged appropriate to drop one control group in order to increase the number of participants, therefore statistical power, in the remaining groups.

Note that the groups sizes were very similar. Tests of the data gathered for this study included the $t$-test and analysis of variance (ANOVA), which are robust to violations of homogeneity of variance as long as group sizes are equal. In this study, group sizes were not exactly equal, but they were close enough that the effect on $\alpha$ was negligible (Glass and Hopkins 1984: 238-240). Consequently, tests of homogeneity of variance were not performed in subsequent analyses.
Table 10-2
Mean Number of Times Participants in Each Group Used Both Sides of the Paper at Various Points in the Experiment

<table>
<thead>
<tr>
<th>Amount of Pre-Manipulation Repetition of the Undesirable Behavior</th>
<th>Control</th>
<th>Persuasion</th>
<th>Persuasion + Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$U_1$</td>
<td>$O_1$</td>
<td>$O_2$</td>
</tr>
<tr>
<td>n = 22</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extensive</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$U_1$</td>
<td>$O_4$</td>
<td>$O_5$</td>
</tr>
<tr>
<td>n = 23</td>
<td>0.00</td>
<td>0.87</td>
<td>0.87</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$U_1$</td>
<td>$O_7$</td>
<td>$O_8$</td>
</tr>
<tr>
<td>n = 24</td>
<td>0.00</td>
<td>2.92</td>
<td>2.92</td>
</tr>
</tbody>
</table>

Another way to get an overview of the results is to look at how many participants in each group switched from using one side of the paper to using both sides. Table 10-3 provides that information.

Table 10-3
Number of Participants Who Switched from Using One Side of the Paper to Using Both Sides

<table>
<thead>
<tr>
<th>Amount of Pre-Manipulation Repetition of the Undesirable Behavior</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control</td>
</tr>
<tr>
<td>Little</td>
<td>0</td>
</tr>
<tr>
<td>Extensive</td>
<td>n/a</td>
</tr>
</tbody>
</table>

* Of the five participants in this group who switched from using one side of the paper to using both sides, three switched for all pairs of lists, one did so after the fifth pair of lists (of 15), and the other did so only for the first ten pairs of lists (of 15).

** Of the four participants in this group who switched from using one side of the paper to using both sides, three switched for all pairs of lists, and one did so after the second pair of lists (of 15).
A Note on Terminology

"Little Pre-Manipulation Repetition of the Undesirable Behavior" and "Extensive Pre-Manipulation Repetition of the Undesirable Behavior" are accurate descriptions of the type of behavior participants engaged in before seeing the videotape containing the behavior change manipulations. These descriptions are, however, lengthy and awkward when they are repeated many times. Consequently, a shorthand terminology was adopted here. Groups with "Little Pre-Manipulation Repetition of the Undesirable Behavior" are referred to as "Short" groups; and groups with "Extensive Pre-Manipulation Repetition of the Undesirable Behavior" are referred to as "Long" groups. Likewise, the "Persuasion" and "Persuasion + Behavior" manipulations are referred to as "Persuasion" and "Behavior."

These changes result in group names that are less accurately descriptive, but much less unwieldy:

- **Short Persuasion** refers to the group with "Little Pre-Manipulation Repetition of the Undesirable Behavior," followed by the "Persuasion" manipulation.
- **Short Behavior** refers to the group with "Little Pre-Manipulation Repetition of the Undesirable Behavior," followed by the "Persuasion + Behavior" manipulation.
- **Long Persuasion** refers to the group with "Extensive Pre-Manipulation Repetition of the Undesirable Behavior," followed by the "Persuasion" manipulation.
- **Long Behavior** refers to the group with "Extensive Pre-Manipulation Repetition of the Undesirable Behavior," followed by the "Persuasion + Behavior" manipulation.

The **Control** group in this experiment had "Little Pre-Manipulation Repetition of the Undesirable Behavior," and no behavior change manipulation.
Manipulation Check

The persuasive and behavioral manipulations were intended to produce more favorable attitudes towards using both sides of the paper in making the lists. For the manipulations to be judged successful, participants in the experimental groups should have more favorable attitudes toward using both sides of the paper than would participants in the control group.

Attitude to using both sides of the paper was measured by summing the three attitude subscales. ("In this study, using two sides of the paper is:... good/bad; wise/foolish; beneficial/harmful.)

Table 10-4 shows the mean and standard deviation of the summed attitude measure for each group.

Table 10-4
Attitude Toward Using Both Sides of the Paper

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>14.18</td>
<td>4.44</td>
<td>22</td>
</tr>
<tr>
<td>Short Persuasion</td>
<td>16.57</td>
<td>3.63</td>
<td>23</td>
</tr>
<tr>
<td>Short Behavior</td>
<td>17.74</td>
<td>3.92</td>
<td>23</td>
</tr>
<tr>
<td>Long Persuasion</td>
<td>17.86</td>
<td>2.52</td>
<td>21</td>
</tr>
<tr>
<td>Long Behavior</td>
<td>19.00</td>
<td>2.21</td>
<td>24</td>
</tr>
<tr>
<td>Entire Sample</td>
<td>17.10</td>
<td>3.76</td>
<td>113</td>
</tr>
</tbody>
</table>

A one-way ANOVA revealed that there were significant differences among the means ($F = 6.37, p = .0001$). A planned contrast confirmed that participants in the experimental groups had more positive attitudes towards using both sides of the paper than did participants in the control group ($t = 4.41, p < .0001$). On the basis of this result, it seems reasonable to conclude that the

\(^{15}\)The $t$-test and analysis of variance are robust to violations of the homogeneity of variance assumption when the group sizes are equal. In this study, group sizes are not exactly equal, but they are close enough that the effect on $\alpha$ will be negligible (Glass and Hopkins 1984: 238-240). Consequently, tests of homogeneity of variance will not be performed in subsequent analyses of these data.
experimental manipulations were successful in producing more favorable attitudes towards using both sides of the paper.

A second issue concerning the experimental manipulations is whether some were more effective than others in producing favorable attitudes toward using both sides of the paper. If so, differences in the behavior produced by the manipulations could be attributed at least partly to their differential success in changing attitudes. This issue was addressed two ways.

First, a post-hoc multiple comparison test was employed. Since no hypotheses had been developed concerning the relative effectiveness of the manipulations in changing attitudes, planned contrasts were not appropriate. The Student-Newman-Keuls procedure, generally the preferred method of doing post-hoc multiple comparisons (Glass and Hopkins 1984), was therefore used to determine which pairs of groups were significantly different at the $\alpha = .05$ level of significance. The Student-Newman-Keuls method is one of several multiple comparison techniques that uses the studentized range statistic, $q$, to compare each mean with each and every other mean (Glass and Hopkins 1984). The procedure yields subsets of means that do not differ significantly. Table 10-5 shows the resulting subsets for the experimental data$^{16}$.

<table>
<thead>
<tr>
<th>SUBSET 1</th>
<th>Group</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>14.18</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUBSET 2</th>
<th>Group</th>
<th>Short Persuasion</th>
<th>Short Behavior</th>
<th>Long Persuasion</th>
<th>Long Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>16.57</td>
<td>17.74</td>
<td>17.86</td>
<td>19.00</td>
<td></td>
</tr>
</tbody>
</table>

$^{16}$The statistical package used to analyze these data, SPSSpc+, does not provide the value of the studentized range statistic, $q$. For that reason, $q$ is not reported here.
According to this test, there was a significant difference between the control group and the experimental groups, but there were no significant differences among the four experimental groups in terms of attitude towards using both sides of the paper in this study.

A two-factor ANOVA was the second approach used to test whether the experimental manipulations were differentially effective in producing more favorable attitudes. Table 10-6 shows the same data as Table 10-4, but set up for the two-factor ANOVA. Table 10-7 shows the results of the ANOVA.

Table 10-6
Attitude Toward Using Both Sides of the Paper

<table>
<thead>
<tr>
<th>Amount of Pre-manipulation Practice</th>
<th>Persuasive Manipulation</th>
<th>Behavior Manipulation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>less (5 lists)</td>
<td>16.57</td>
<td>3.63</td>
</tr>
<tr>
<td>more (30 lists)</td>
<td>17.86</td>
<td>2.52</td>
</tr>
</tbody>
</table>

Table 10-7
Analysis of Variance:
Effectiveness of Manipulations in Producing Favorable Attitudes

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practice</td>
<td>1</td>
<td>36.99</td>
<td>3.71</td>
<td>.057</td>
</tr>
<tr>
<td>Treatment</td>
<td>1</td>
<td>30.47</td>
<td>3.06</td>
<td>.084</td>
</tr>
<tr>
<td>Practice × Treatment</td>
<td>1</td>
<td>00.01</td>
<td>&lt;.01</td>
<td>.981</td>
</tr>
</tbody>
</table>

The results in Table 10-7 are consistent with those of the multiple comparison. Both tests indicate that the attitudes generated by the manipulations did not differ significantly among the experimental groups.

Another issue related to the manipulation check concerns the role that concomitant variables might play in participants' behavior. Analysis of covariance (ANCOVA) was used to examine the effects of the following concomitant variables on participants' behavior after the manipulations: sex, age, size of home community, academic degree sought, and importance of environmental issues. Three ANCOVAs were performed. The first examined the effect of the concomitant variables on
whether participants used one or both sides of the paper in the first ten lists post-manipulation. None of the concomitant variables had a significant effect (for sex, $F = 1.31, p = 0.25$; for age, $F = 0.08, p = 0.78$; for size of home community, $F = 0.01, p = 0.78$; for degree sought, $F = 2.19, p = 0.14$; and for importance of environmental issues, $F = 0.61; p = 0.44$).

The second ANCOVA examined the effect of the concomitant variables on whether participants used one or both sides of the paper in the final ten of the 30 post-manipulation lists. Again, none of the concomitant variables had a significant effect (for sex, $F = 1.70, p = 0.20$; for age, $F = 1.66, p = 0.20$; for size of home community, $F = 0.002, p = 0.96$; for degree sought, $F = 2.13, p = 0.15$; and for importance of environmental issues, $F = 1.42; p = 0.24$).

The third ANCOVA examined the effect of the concomitant variables on whether participants used one or both sides of the paper in the whole series of 30 post-manipulation lists. Here, too, none of the concomitant variables had a significant effect (for sex, $F = 1.76, p = 0.19$; for age, $F = 0.74, p = 0.39$; for size of home community, $F = 0.01, p = 0.95$; for degree sought, $F = 2.09, p = 0.15$; and for importance of environmental issues, $F = 0.92; p = 0.34$).

These results rule out the possibility that resource use after the manipulations could be due to sex, age, size of home community, and importance of environmental issues.\(^{17}\)

**Hypotheses Concerning Groups with Less Premanipulation Task Experience**

The first set of hypotheses concerns the groups with less task experience. Participants in the Control, Short Persuasion, and Short Behavior groups completed only five lists before viewing the videotape in which the manipulations were delivered. According to the theory developed earlier in

\(^{17}\)It may seem surprising that participants’ evaluation of the importance of environmental issues in their own lives would not have a significant effect on their resource use. Actually, it is not surprising at all, for two reasons. First, it is well established that in the area of environmental issues, what people say and what they do are often independent; second, it is also well established that global attitudes are very poor predictors of specific behaviors. Therefore, even when people say that the environment is important in their lives, their behavior in any specific context may not reflect that degree of importance.
this dissertation research, it should be relatively easy to effect change in these groups, as the undesirable behavior has not been practised enough to become habit-like. Results of tests of the specific hypotheses and certain underlying assumptions are detailed below.

**Assumption 1A.** It was assumed that all participants in the low-practice groups (Control, Short Persuasion, Short Behavior) would initially do the task using one side of the paper only. This assumption was verified by counting the number of times each participant used both sides of the paper in the first series of lists (before the videotape containing the manipulations was shown). All participants in the low-practice groups did all lists in the first series using only one side of the paper. Assumption 1A is therefore confirmed.

**Assumption 1B.** It was assumed that in the low practice groups, the task itself would not induce participants to switch from using one side of the paper to using both sides of the paper. This assumption was verified by counting the number of times participants in the Control group (who received no manipulation encouraging them to switch from using one side to using both sides of the paper) used both sides of the paper in the five lists completed before the videotape was shown, in the ten lists immediately following the videotape, and in the final ten of the 30 lists made after the videotape was shown. All participants in the Control group \( n = 22 \) used only one side of the paper throughout the study. Assumption 1B is therefore confirmed.

**Hypothesis 1A.** The statement of this hypothesis in theoretical terms is:

If the undesirable behavior has not been extensively repeated (i.e., has not become habit-like), then a persuasive message that produces (or activates) a (more) positive attitude toward the desirable behavior will induce the desirable behavior.

In the context of this study, the undesirable behavior is the use of one side of the paper; and the desirable behavior is the use of both sides of the paper. Hypothesis 1A was tested two ways. First, participants in the Control and Short Persuasion groups were compared in terms of the mean number of times they used both sides of the paper in the ten lists immediately following the videotape was compared. As Table 10-8 shows, none of the participants in the Control group used both sides of
the paper after viewing the videotape; however, on average, participants in the Short Persuasion group used both sides of the paper .87 times in the ten lists immediately following the video (where five times would be the maximum possible). This represents a significant difference between the two groups ($t = 2.07, p = .022$).

Table 10-8
Comparison of the Average Number of Times Participants in the Control and Short Persuasion Groups Used Both Sides of the Paper for Lists Immediately Following the Videotape

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
<th>t-value</th>
<th>p (1-tail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>0.00</td>
<td>0.00</td>
<td>22</td>
<td>2.07</td>
<td>.022</td>
</tr>
<tr>
<td>Short Persuasion</td>
<td>0.87</td>
<td>1.94</td>
<td>23</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hypothesis 1A was also evaluated with the binomial test, a nonparametric test that was used to indicate whether the proportion of participants in the Short Persuasion Group who switched from using one side of the paper to using both sides ($4/23 = 0.17$) was significantly greater than that in the Control group ($0/22 = 0.00$). The binomial test confirmed that the proportions were significantly different ($p < .0001$).

Based on the results of the $t$-test and the binomial test, Hypothesis 1A is supported.

**Hypothesis 1B.** The statement of Hypothesis 1B in theoretical terms is:

If the undesirable behavior has not been extensively repeated (i.e., has not become habit-like), then a manipulation that both induces positive attitudes toward the desirable behavior and reinforces positive attitudes through limited practice of the desirable behavior will also induce the desirable behavior in the post-manipulation period.

Hypothesis 1B was tested by comparing the mean number of times participants in the Control and Short Behavior groups used both sides of the paper in the ten lists immediately following the videotape. As Table 10-9 shows, none of the participants in the Control group used both sides of the paper after viewing the videotape; however, on average, participants in the Short Behavior group used both sides of the paper 2.92 times in the ten lists immediately following the video (where five
times would be the maximum possible). This represents a significant difference between the two groups ($t = 5.67, p < 0.001$).

Table 10-9
Comparison of the Average Number of Times Participants in the Control and Short Behavior Groups Used Both Sides of the Paper for Lists Immediately Following the Videotape

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
<th>t-value</th>
<th>p (1-tail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>0.00</td>
<td>0.00</td>
<td>22</td>
<td>5.67</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Short Behavior</td>
<td>2.92</td>
<td>2.52</td>
<td>24</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hypothesis 1B was also evaluated with the binomial test, a nonparametric test that was used to indicate whether the proportion of participants in the Short Behavior Group who switched from using one side of the paper to using both sides ($14/23 = 0.61$) was significantly greater than that in the Control group ($0/22 = 0.00$). The binomial test confirmed that the proportions were significantly different ($p < .0001$).

Based on the results of the $t$-test and the binomial test, Hypothesis 1B is supported.

A stronger statement of Hypothesis 1B would be:

If the undesirable behavior has not been extensively repeated (i.e., has not become habit-like), then a manipulation that both induces positive attitudes toward the desirable behavior and reinforces positive attitudes through limited practice of the desirable behavior will be no more effective in inducing the desirable behavior in the post-manipulation period than will a manipulation that (merely) induces positive attitudes toward the desirable behavior.

The issue of whether the persuasive manipulation alone was as effective as the behavioral manipulation was addressed with a $t$-test, as shown in Table 10-10.

Table 10-10
Comparison of the Average Number of Times Participants in the Short Persuasion and Short Behavior Groups Used Both Sides of the Paper for Lists Immediately Following the Videotape

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
<th>t-value</th>
<th>p (2-tail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short Persuasion</td>
<td>0.87</td>
<td>1.94</td>
<td>23</td>
<td>3.13</td>
<td>.003</td>
</tr>
<tr>
<td>Short Behavior</td>
<td>2.92</td>
<td>2.52</td>
<td>24</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The results of the \( t \)-test indicate that, in the first ten lists after the videotape, participants in the Short Behavior group used both sides of the paper significantly more often than did participants in the Short Persuasion group (means of 2.92 times and 0.87 times, respectively; \( t = 3.13, p = .003 \)).

A chi-square test was also performed to determine whether participants in the Short Persuasion and Short Behavior groups were equally likely to switch from using one side of the paper to using both sides. In the Short Persuasion group, 4 of 23 participants (17.4\%) switched; in the Short Behavior group, 14 of 24 participants (58.3\%) switched. This represents a significant difference (\( \chi^2 = 8.33, p < .004 \)).

Based on the results of the \( t \)-test and the chi-square test, the strong form of Hypothesis 1B is rejected.

**Hypothesis 1C.** The statement of this hypothesis in theoretical terms is:

If the undesirable behavior has not been extensively repeated (i.e., has not become habit-like), then as experience with the situation accumulates, the behavior change induced by a manipulation that both induces positive attitudes toward the desirable behavior and reinforces positive attitudes through limited practice of the desirable behavior will be sustained better than the behavior change induced by a persuasive message that produces (or activates) a (more) positive attitude toward the desirable behavior.

Hypothesis 1C was evaluated by comparing the number of times participants in the Short Behavior and Short Persuasion groups used both sides of the paper in the first ten lists following the videotape with the number of times they used both sides of the paper in the final ten (of 30) lists. In both groups, all participants maintained the same behavior for all lists following the videotape. All participants in the Short Persuasion and Short Behavior groups who used both sides of the paper in the first ten lists following the videotape continued to use both sides of the paper for all 30 lists. Hypothesis 1C is therefore rejected.
**Hypotheses Concerning Groups with More Premanipulation Task Experience**

The second set of hypotheses concerns the groups with more task experience. Participants in the Long Persuasion and Long Behavior groups completed 30 lists before viewing the videotape in which the manipulations were delivered. According to the theory developed earlier in this dissertation research, it should be relatively difficult to effect change in these groups, as the undesirable behavior has been practiced enough to become habit-like. Results of tests of the specific hypotheses and certain underlying assumptions are detailed below.

Note that there was no control group among the groups with more premanipulation task experience. Given the number of participants available, it was decided to sacrifice this control group in order to increase numbers (and, therefore, power) in the treatment groups.

**Assumption 2A.** As in the groups with less premanipulation task experience, it was assumed that all participants would use only one side of the paper before seeing the videotape. This assumption was verified by counting the number of times each participant used both sides of the paper in the first series of lists (before the videotape containing the manipulations was shown). All participants in the high-practice groups did all lists in the first series using only one side of the paper. Assumption 2A is therefore confirmed.

**Assumption 2B.** It was assumed that, as in the low practice groups, the task itself would not induce high practice participants to switch from using one side of the paper to using both sides of the paper. Assumption 2B was not tested.

**Hypothesis 2A.** The statement of this hypothesis in theoretical terms is:

*If the undesirable behavior has been extensively repeated (i.e., has become habit-like), then a persuasive message that produces a positive attitude toward the desirable behavior will not induce the desirable behavior in the post-manipulation period.*

Hypothesis 2A was tested by examining the mean number of times participants in the Long Persuasion group used both sides of the paper in the first ten and the last ten (of 30) lists after the videotape was shown. As Table 10-11 shows, on average, participants in the Long Persuasion group
used both sides of the paper 0.87 times (out of a maximum of five) in both the first ten lists and the last ten lists after the videotape. A $t$-test indicates that this value is significantly greater than zero ($t = 2.15, p = .022$). This result does not support Hypothesis 2A.

| Table 10-11 |
| Comparison of the Average Number of Times Participants in the Long Persuasion Group Used Both Sides of the Paper for Lists Following the Videotape |
| Post-manipulation Lists | Mean | SD | n |
| First ten | 0.87 | 1.94 | 23 |
| Final ten | 0.87 | 1.94 | 23 |

Hypothesis 2A was also evaluated with the binomial test, a nonparametric test that was used to indicate whether the proportion of participants in the Long Persuasion Group who switched from using one side of the paper to using both sides ($5/23 = 0.22$) was significantly greater than zero. The binomial test confirmed that the proportion was significantly different ($p < .0001$), again failing to support Hypothesis 2A.

On the basis of the results of the $t$-test and the binomial test, Hypothesis 2A is rejected.

**Hypothesis 2B.** The statement of this hypothesis in theoretical terms is:

If the undesirable behavior has been extensively repeated (i.e., has become habit-like), then a manipulation that both induces positive attitudes toward the desirable behavior and reinforces those positive attitudes through limited practice of the desirable behavior will induce the desirable behavior in the post-manipulation period.

Hypothesis 2B was tested by examining the mean number of times participants in the Long Behavior group used both sides of the paper in the first ten (of 30) lists after the videotape was shown. As Table 10-12 shows, on average, participants in the Long Persuasion group used both sides of the paper 0.72 times (out of a maximum of five) in the first ten lists after the videotape. A $t$-test indicates that this value is significantly greater than zero ($t = 2.09, p = .024$). This result supports Hypothesis 2B.
Hypothesis 2B was also evaluated with the binomial test, a nonparametric test that was used to indicate whether the proportion of participants in the Long Behavior Group who switched from using one side of the paper to using both sides (4/25 = 0.16) was significantly greater than zero. The binomial test confirmed that the proportion was significantly different (p < .0001), providing additional support for Hypothesis 2B.

Based on the results of the t-test and the binomial test, Hypothesis 2B is supported.

**Hypothesis 2C.** The statement of this hypothesis in theoretical terms is:

If the undesirable behavior has been extensively repeated (i.e., has become habit-like), then as experience with the situation accumulates, behavior change induced by a manipulation that both induces positive attitudes toward the desirable behavior and reinforces those attitudes through limited practice of the desirable behavior will decay.

Hypothesis 2C was evaluated by comparing, for participants in the Long Behavior group, the number of times both sides of the paper was used in the first ten lists after the videotape with the number of times both sides of the paper was used in the final ten (of 30) lists after the videotape. As Table 10-13 shows, contrary to Hypothesis 2C, use of both sides of the paper actually increased slightly, although the increase was not statistically insignificant (t = 1.00, p = .327).

Table 10-12
Average Number of Times Participants in the Long Behavior Group Used Both Sides of the Paper for Lists Immediately Following the Videotape

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
<th>t-value</th>
<th>p (1-tail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long Behavior</td>
<td>0.72</td>
<td>1.72</td>
<td>25</td>
<td>2.09</td>
<td>.024</td>
</tr>
</tbody>
</table>

Hypothesis 2C is therefore rejected.
**Hypothesis 2D.** The statement of this hypothesis in theoretical terms is:

If the undesirable behavior has been extensively repeated (i.e., has become habit-like) then as experience with the situation accumulates, behavior change induced by a manipulation that both induces positive attitudes toward the desirable behavior and reinforces those positive attitudes through limited practice of the desirable behavior will be greater than behavior change (if any) following a manipulation that produces a positive attitude toward the desirable behavior.

Hypothesis 2D was evaluated by comparing the number of times participants in the Long Persuasion and Long Behavior groups used both sides of the paper in the last ten lists (of 30) following the videotape. As Table 10-14 shows, contrary to the prediction in Hypothesis 2D, participants in the Long Persuasion group used both sides of the paper more frequently than did participants in the Long Behavior group, although the difference is not statistically significant.

**Table 10-14**
Comparison of the Average Number of Times Participants in the Long Persuasion and Long Behavior Groups Used Both Sides of the Paper for the Final Ten Lists Following the Videotape

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
<th>t-value</th>
<th>p (2-tail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long Persuasion</td>
<td>0.87</td>
<td>1.94</td>
<td>23</td>
<td>0.13</td>
<td>.900</td>
</tr>
<tr>
<td>Long Behavior</td>
<td>0.80</td>
<td>1.87</td>
<td>25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hypothesis 2D is therefore rejected.

**Hypotheses Concerning the Relative Effectiveness of the Manipulations Across Different Levels of Premanipulation Task Experience**

The third set of hypotheses concerns the relative effectiveness of persuasion alone versus persuasion with behavioral reinforcement depending on whether the undesirable behavior had been extensively practised.
Hypothesis 3A. The statement of this hypothesis in theoretical terms is:

A manipulation that merely induces (or activates) (more) positive attitudes toward the desirable behavior will be less effective if the undesirable behavior has been extensively repeated (i.e., has become habit-like) than if the undesirable behavior has not been extensively repeated.

Hypothesis 3A was tested by comparing the number of times participants in the Short Persuasion and Long Persuasion groups used both sides of the paper in the ten lists immediately following the videotape. As Table 10-15 shows, contrary to Hypothesis 3A, the persuasive manipulation was equally effective when the undesirable behavior had been extensively repeated and when it had not been extensively repeated.

Table 10-15
Comparison of the Number of Times Participants in the Short Persuasion and Long Persuasion Groups Used Both Sides of the Paper in the Lists Immediately Following the Videotape

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
<th>t-value</th>
<th>p (2-tail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short Persuasion</td>
<td>0.87</td>
<td>1.94</td>
<td>23</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Long Persuasion</td>
<td>0.87</td>
<td>1.94</td>
<td>23</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hypothesis 3A is therefore rejected.

Hypothesis 3B. The statement of this hypothesis in theoretical terms is:

A manipulation that both induces (or activates) (more) positive attitudes toward the desirable behavior and reinforces that behavior with limited practice will be equally effective whether or not the undesirable behavior has been extensively repeated (i.e., has become habit-like).

Hypothesis 3B was tested by comparing the number of times participants in the Short Behavior and Long Behavior groups used both sides of the paper in the ten lists immediately following the videotape. As Table 10-16 shows, contrary to Hypothesis 3B, the behavioral manipulation was more effective when the undesirable behavior had not been extensively repeated than when it had been extensively repeated.
Table 10-16
Comparison of the Number of Times Participants in the Short Behavior and Long Behavior Groups Used Both Sides of the Paper in the Lists Immediately Following the Videotape

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
<th>t-value</th>
<th>p (2-tail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short Behavior</td>
<td>2.92</td>
<td>2.52</td>
<td>24</td>
<td>3.55</td>
<td>.001</td>
</tr>
<tr>
<td>Long Behavior</td>
<td>0.72</td>
<td>1.72</td>
<td>25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hypothesis 3B is therefore rejected.

Summary of the Experimental Results

There were several unexpected and interesting findings from this experiment. First, when the undesirable behavior had not been extensively practised (i.e., had not become habit-like), a manipulation that both induced positive attitudes toward the desirable behavior and reinforced those positive attitudes through limited practice of the desirable behavior was more effective in inducing the desirable behavior than was a manipulation that merely induced positive attitudes. In other words, in the volitional group, the persuasion + behavior manipulation was more effective than the persuasive manipulation. Furthermore, based on analyses associated with the manipulation check, the difference in effectiveness cannot be accounted for by differences in attitude toward the desirable behavior, as there is no significant difference between the groups on that variable.

The second unexpected and interesting finding was that when the undesirable behavior had been extensively practised (i.e., had become habit-like), there was no advantage to the behavioral reinforcement. In other words, in the "habit-like" group, the behavioral manipulation was no more effective than was the persuasive manipulation. In fact, reinforcing the persuasive manipulation with limited practice of the desirable behavior was slightly less effective than the persuasive manipulation alone, although the difference was not statistically significant.

The third unexpected and interesting finding was that merely inducing a positive attitude toward the desirable behavior was equally effective whether the undesirable behavior had been extensively practised or not; however, the same was not true when the positive attitudes were
reinforced with limited practice. In the latter situation, the behavioral manipulation was significantly more effective in changing the behavior of participants who had had less premanipulation experience with the undesirable behavior. In other words, the persuasive manipulation worked equally well in both the "habit-like" and "volitional" groups, but the behavioral manipulation worked better in the "non-habit" group than it did in the "habit-like" group.

The fourth unexpected and interesting finding is that, at the point when participants in the Short Behavior group had done the same total number of lists as the Long Behavior group had done by the end of the videotape (i.e., 45 lists), they did not, unlike the Long Behavior participants, switch back to using one side of the paper.

As in many exploratory studies, this experiment raises many new and interesting questions. The following chapter will discuss some of those questions, and point out additional factors and variables which will need to be explored in future research.
CHAPTER 11
STUDY 2: DISCUSSION

The previous two chapters described the design, analysis, and results of an experiment intended to test some of the theory developed in Chapter 8, which concerns the way that complex, habit-like behaviors change. The theory proposed that such change proceeds in three steps: de-automation of the old habit-like behavior, volitional change of that behavior, and consolidation of the new behavior. Based on this theory, it was predicted that persuasion-based approaches to behavior change would be effective in changing behavior that had not yet been practised enough to become habit-like; but for behaviors that had been practised extensively enough to be considered habitual or habit-like, persuasion alone would not be enough — behavioral reinforcement would also be necessary.

To test these predictions, a laboratory experiment was run. Participants were asked to make a series of lists, each on a different page of a four-by-six-inch pad of paper. Some of them did five lists (little pre-manipulation practice), and some did 30 lists (extensive pre-manipulation practice). At this stage, all the participants used only one side of the paper. Then the manipulations were delivered. Some participants received a persuasive message suggesting that they use both sides of the paper, and some received the same persuasive message reinforced with limited practice of the desired behavior. The dependent variable was the number of times participants used both sides of
the paper in lists made after the manipulation was delivered. As Chapter 10 indicated, results of the experiment were mixed, with several unexpected and interesting findings.

This chapter discusses theoretical and methodological issues arising from Study 2. It begins with a brief discussion of the experimental procedure itself. The organization of the remainder of the chapter parallels that of Chapter 10, examining first the results obtained in the Little Pre-Manipulation Practice groups, then those for the Extensive Pre-Manipulation Practice groups, and finally those comparing the effectiveness of the manipulations across the two levels of pre-manipulation practice.

The Experimental Procedure

As the review of the demarketing literature which appears in Chapter 2 indicates, there has been little empirical research done in this area. Furthermore, there is almost no experimental research. This gap may be due to the difficulty of designing an experimental procedure that captures the critical aspects of demarketing problems: people have become accustomed to using the resource wastefully; the resource is merely a means to an end; changing behavior to use less of the resource is costly (though not necessarily in financial terms); conserving the resource has uncertain returns that will accrue in the future, probably to people other than those making the effort; and there is no obvious reason (such as a shortage of the resource) to conserve. (See Chapter 9 for a more complete discussion of these criteria.)

The procedure used in this experiment meets these criteria and therefore opens the door to further experimental research in demarketing. There were limitations, as the discussion below indicates, but they were of an operational nature. The basic procedure seems to have been successful in simulating the key characteristics of demarketing problems.
Little Pre-Manipulation Practice Groups

Participants in the Little Pre-Manipulation groups completed only five lists before receiving the manipulation. Such minimal practice is very unlikely to lead to habitual or habit-like use of one side of the paper for the list-making task. It was expected that, since the use of one side of the paper for this task was not habitual, a persuasive message alone should be enough to convince participants to change their behavior. A persuasive message reinforced with limited practice of the desired behavior (using both sides of the paper) was also expected to be effective, but no more effective than the persuasive message alone. In other words, when the behavior is not habitual or habit-like, a persuasive message alone should lead to behavior change; behavioral reinforcement would be redundant.

As expected, the results showed that the persuasive message alone did lead to behavior change. Also as expected, a persuasive message reinforced with limited behavioral practice was effective. However, contrary to expectations, persuasion with behavioral reinforcement was much more effective than persuasion alone: 56% of participants who received a persuasive message and had an opportunity to practice using both sides of the paper switched, while only 17% of those who received the persuasive message alone switched. In this experiment, it appears that behavioral reinforcement was anything but redundant. Another unexpected result was that there was no decay in the conservation behavior of either the participants exposed to the persuasive message alone or those exposed to both a persuasive message and behavioral reinforcement. The unexpected results raise both methodological and theoretical issues.

Methodological Issues. On the methodological side, one explanation for the strong effect of behavioral reinforcement is that, because the number of lists done in the behavioral reinforcement portion of the experiment was three times the number done in the pre-manipulation practice portion (15 lists for behavioral reinforcement versus five lists for pre-manipulation practice), the behavioral reinforcement may have swamped the effect of the pre-manipulation practice. It could be argued that
participants with little pre-manipulation practice in the Persuasion + Behavior group got three times as much practice using two sides of the paper as using one side. It is possible that for a task as simple as the one in the experiment a level of practice between five and fifteen lists might be enough to form a habit-like tendency to use two sides of the paper.

The counterargument is that participants in the Persuasion + Behavior group did not really have 15 opportunities to use both sides of the paper; they only had seven. Only on the even numbered lists could a participant use the second side of the paper. Consequently, although there was an imbalance between the pre-manipulation practice and the behavioral reinforcement, it was not as large as it might initially seem. Nevertheless, without further research the possibility that that difference may have been large enough to cause the unexpected result cannot be eliminated.

Further research using this experimental procedure should balance the number of pre-manipulation lists (which, based on the experience in this experiment, people invariably do one-sided) with the number of two-sided lists done in the manipulation. For instance, if five lists are done in the pre-manipulation period, then ten lists should be done for behavioral reinforcement (providing five opportunities to practice using the second side of the paper).

A second possible methodological explanation for the unexpected importance of behavioral reinforcement in the Little Pre-manipulation Practice group concerns the strength of the persuasive message, particularly relative to the strength of the behavioral reinforcement. The persuasive message delivered in the videotape was:

We are finding that a lot of paper is being wasted in this study, since we have to have each list on a separate page and most people use only one side of the paper. If you could use both sides of the paper, that would waste less paper and save a few trees. Whether you use one side or two makes no difference to the study, but it would be good for the environment.
If persuasive messages can be thought of as being on a continuum from "soft sell" to "hard sell," this one would clearly be closer to the soft sell end\textsuperscript{18}. A soft sell message was preferable to a hard sell message for two reasons. First, a hard sell message might be perceived by participants as an instruction. Second, if the message were too attention-getting, it might raise suspicions in participants' minds concerning the true purpose of the study. If either of these eventualities occurred, changes in behavior unrelated to participant attitudes toward conservation would likely occur.

Nevertheless, even given that a soft sell message was desirable, the particular message used in this experiment cannot be called persuasive in the sense of making any real attempt to change attitudes toward using both sides of the paper. Rather, its purpose was to activate existing attitudes.

In contrast, the behavioral reinforcement was directed, focused, and relatively hard sell. However, it cannot be said that it was so hard sell as to be mistaken for instructions or to raise suspicions, since only 37\% of all participants exposed to it (i.e., participants in the Persuasion + Behavior condition for both the Little and Extensive Pre-Manipulation Practice groups) changed their behavior.

Future research should seek a better balance between the strength of the persuasive message and the strength of the behavioral reinforcement. One way to strengthen the persuasive message without drawing too much attention to it or having it be perceived as instructions might be to alter the experimental task and cover story slightly. The study could be presented as an investigation of the memorability of persuasive messages. The same network model of memory could be explained and the basic procedure would stay the same, except that participants would view a series of ads

\textsuperscript{18}Although closer to the soft sell end of the persuasive continuum than to the hard sell end, the message used in the experiment was not the softest sell; an even milder version was pretested. In a category called "Things you can do to help the environment" the following explanation was given:

This is a big category. There are so many things we can do. In this category I would list things like recycling soft drink cans, recycling newspapers, recycling glass, . . . , and even using two sides of the paper in this experiment."

It changed no one's behavior in the pretest.
(instead of making a series of lists), after each of which (or after having seen, say, a batch of five), they would write down on a piece of paper all that they remember from the ad. The ads before the manipulations would have no connections with each other; the ads after would. The persuasive message to use both sides of the paper would be delivered during the explanation of the network model, just as it was in the present experiment, but it could be delivered in a much more openly persuasive manner, as it would be just another one of many persuasive messages to which participants were being exposed.

The explanation for the lack of decay among participants who switched to using two sides of the paper may also be due to a methodological flaw: the number of post-manipulation lists may have been too few, and too close in time to the manipulations. An option for future research is to do 30 lists after the manipulations have been delivered, as was done in this experiment, then add another distractor videotape, and then do another series of lists.

**Theoretical Issue.** The unexpected findings also raise a theoretical issue. Why would Persuasion + Behavior be so much more effective than Persuasion alone when the wasteful behavior had been practised so little that it is unlikely to have become habitual or habit-like? One possible explanation relates to the role of involvement.

Zaichkowsky (1985) defines involvement as "a person's perceived relevance of the object based on inherent needs, values, and interests" (p. 342). People whose involvement with an object is high tend to process more information about it than do people whose involvement with an object is low. Petty, Cacioppo, and Schumann (1983) differentiate between "central" and "peripheral" routes to attitude change. The former involves relatively deep processing of relevant information, while the latter involves relatively shallow processing:

[T]he *central route* views attitude change as resulting from a person's diligent consideration of information that s/he feels is central to the true merits of a particular attitudinal position... Attitude changes induced via the central route are postulated to be relatively enduring and predictive of behavior.
Attitude changes that occur via the peripheral route do not occur because an individual has personally considered the pros and cons of the issue, but because the attitude issue or object is associated with positive or negative cues — or because the person makes a simple inference about the merit of the advocated position based on various simple cues in the persuasion context. . . Attitude changes induced under the peripheral route are postulated to be relatively temporary and unpredictable of behavior (Petty, Cacioppo, and Schumann 1983: 135-136).

In this experiment, where the paper is merely a means to an end, and there is plenty of extra paper in full view (so participants anticipate no impending shortage), involvement with the resource would tend to be low. This is consistent with what would normally occur in a typical demarketing situation: the resource is taken for granted.

Given that involvement with the resource is low, the peripheral route would be favored. Consequently, in the Little Pre-Manipulation Practice groups, the persuasive message alone would merely act as a cue to attitudes toward conservation. Most participants would continue to use one side of the paper because they were not involved enough to bother assessing the pros and cons of changing their behavior. However, when the persuasive message was reinforced with limited behavioral practice, participants gained experience with both behavioral options: their initial experience was using one side of the paper, while their later experience was using both sides of the paper. Once they tried both options (i.e., weighed the pros and cons), more than half switched to the desired behavior.

This raises an interesting question. Compelling participants to try the two-sided option essentially forced them to consider (or at least experience) the pros and cons of switching. In other words, they were emulating the deeper, central route to persuasion. The question is: did this increase participants’ level of involvement with the resource, or could the emulation of the deeper, central route to persuasion constitute some sort of increased pseudo-involvement? Unfortunately, involvement was not measured at any point in this experiment, so these data cannot answer that
question. There is no way to tell from Study 2 data whether involvement with the resource increased or stayed the same when participants used both sides of the paper.

The data from this experiment suggest that, in situations where people have not developed habits or habit-like behaviors, demarketing programs that can get people to act as if they had a higher level of involvement (it is unknown at this point whether their real level of involvement actually increases) will be more effective than demarketing programs that do not increase people's level of involvement. Clearly, more theory concerning the role of involvement and, if it exists, pseudo-involvement, needs to be developed. That is a task for future research.

**Extensive Pre-Manipulation Practice Groups**

Participants in the Extensive Pre-Manipulation groups completed 30 lists before receiving the manipulation. Based on pretests, that level of practice was assumed to lead to habitual or habit-like use of one side of the paper for the list-making task. It was expected that, since the use of one side of the paper for this task was habitual or habit-like, a persuasive message alone should not be enough to convince participants to change their behavior. A persuasive message reinforced with limited practice of the desired behavior (using both sides of the paper) was expected to be effective. In other words, when the behavior is habitual or habit-like, a persuasive message alone should not lead to behavior change; behavioral reinforcement would also be necessary.

As expected, a persuasive message reinforced with limited behavioral practice was effective. But, contrary to expectations, the persuasive message alone did lead to behavior change. In addition, also contrary to expectations, persuasion with behavioral reinforcement was no more effective than persuasion alone: 22% of participants who received a persuasive message alone switched, while 17% of those who received the persuasive message reinforced by limited practice of the desired behavior switched (the difference was not statistically significant). In this experiment, it appears that behavioral reinforcement added nothing. Another unexpected result was that there was no decay in
the conservation behavior of either the participants exposed to the persuasive message alone or those exposed to both a persuasive message and behavioral reinforcement. The unexpected results raise both methodological and theoretical issues.

**Methodological Issues.** On the methodological side, the explanation for the lack of decay among participants who switched to using two sides of the paper is the same as it was for the Little Pre-manipulation Practice groups: the number of post-manipulation lists may have been too few, and too close in time to the manipulations. Again, an option for future research is to do 30 lists after the manipulations have been delivered, as was done in this experiment, then add another distractor videotape, and then do another series of lists.

The more serious question concerns why the behavioral reinforcement added nothing. One possibility is that the behavioral reinforcement simply was not strong enough. Participants in the Extensive Pre-Manipulation Practice groups had done 30 lists using one side of the paper. Those in the Persuasion + Behavior group made 15 lists during the behavioral reinforcement portion of the experiment. This represents only seven opportunities to use the second side of the paper. It may be that the amount of behavioral reinforcement needed to overcome a habitual or habit-like behavior would be in the same range as the original amount of pre-manipulation practice. The results for the Little Pre-Manipulation groups are consistent with this suggestion. Efforts should be made in future research to determine what relative levels of behavioral reinforcement are necessary to overcome the effects of existing practice.

**Theoretical Issue.** The unexpected findings may also have a more theoretical explanation. It may be that, as people who habitually waste a resource gain experience with using less of it, they become more aware of the costs (e.g., inconvenience) associated with changing their behavior. In other words, the behavioral reinforcement actually reminds them of all the reasons they _do not_ want to switch from using one side of the paper to using both sides (and in this experiment, the disadvantages of using both sides of the paper would have been very evident to participants, because
they were under time pressure, and using both sides of the paper slowed them down). This would be less likely to occur among people whose behavior is not habitual or habit-like simply because their system for doing the task is (by definition) more flexible, so it is easier for them to accommodate changes.

In Chapter 8, it was proposed that changing habits or habit-like behaviors proceeds in three steps: de-automation, volitional behavior change, and consolidation. It was pointed out there that de-automation requires, first, that people know precisely what behavior(s) to change, second, that they can reliably anticipate the performance of the behavior, and third, that they have enough motivation to invest the cognitive energy necessary to bring the habit under conscious control. At this preliminary stage in testing the theory, choices were made concerning which variables to manipulate, and which ones not to manipulate. The criterion used was the likely importance of the variable in explaining and predicting behavior. In the absence of previous empirical tests of the theory, the decision was made not to manipulate motivation. Based on the results in the Extensive Pre-Manipulation Practice groups, it would seem worthwhile for future research to investigate more closely the role of motivation.

Relative Effectiveness of the Manipulations Across Pre-Manipulation Levels

There were also unexpected results when the manipulations (Persuasion alone or Persuasion + Behavior) were compared across different levels of pre-manipulation practice. Specifically, it was expected that Persuasion alone would be more effective for people who had had Little Pre-Manipulation Practice of the undesirable behavior than for people who had had extensive Pre-Manipulation Practice, because persuasion alone should not be powerful enough to overcome habitual or habit-like tendencies. In this experiment, however, Persuasion was equally effective for both Little and Extensive Pre-Manipulation Practice. It was also expected that Persuasion + Behavior would be equally effective for both levels of Pre-Manipulation Practice. Unexpectedly, it was more
effective for the Little Pre-Manipulation Practice group than for the Extensive Pre-Manipulation group.

The first unexpected result, that Persuasion alone was equally effective for both Little and Extensive Pre-Manipulation Practice, might be explained as a methodological weakness. If, as seems likely, the persuasive message used in the manipulation did not change attitudes, but merely activate existing attitudes, then the only people to switch would be those who had existing favorable attitudes toward conserving paper by using both sides. The fact that the same percentage of each group switched tends to support this explanation: if attitudes toward using both sides of the paper are randomly distributed through the population, then a random assignment of participants should yield the same proportions of participants with existing positive attitudes toward using both sides of the paper. As noted earlier, attention should be paid in future research to ensuring that the persuasive message is actually persuasive, not just something that activates existing favorable attitudes, if any.

The second unexpected result, that Persuasion + Behavior was more effective for the Little Pre-Manipulation Practice group than for the Extensive Pre-Manipulation group, is also consistent with earlier explanations. Specifically, in the Little Pre-Manipulation Practice group, the behavioral reinforcement may have caused participants to increase involvement, or pseudo-involvement, with the decision to use one or both sides of the paper, which led a sizeable number of them to change their behavior. In contrast, in the Extensive Pre-Manipulation Practice group, the behavioral reinforcement may have made salient the costs (in terms of inconvenience, loss of speed, etc.), thereby actually discouraging switching — once again highlighting the importance of motivation in the de-automation process.

Summary

Chapter 11 has discussed some of the theoretical and methodological issues arising from Study 2. The chapter began with an evaluation of the suitability of the experimental procedure as
a method for studying typical demarketing problems. The conclusion was that, while there were some implementation problems in Study 2, they are surmountable. The experimental procedure was judged to have been successful in capturing the essential characteristics of demarketing problems.

This chapter also outlined some of the methodological problems encountered in Study 2, and made suggestions for change. One recommendation was that future research using this experimental procedure should balance the number of pre-manipulation lists (which, based on the experience in this experiment, people invariably do one-sided) with the number of two-sided lists done in the manipulation.

A second recommendation concerning methodology was that future research should seek a better balance between the strength of the persuasive message and the strength of the behavioral reinforcement. One way to strengthen the persuasive message without drawing too much attention to it or having it be perceived as instructions might be to alter the experimental task and cover story slightly such that participants would view a series of persuasive messages, so that the persuasive message of interest could be delivered in a much more openly persuasive way, without drawing undue attention.

A third recommendation was that, in order to provide an opportunity for decay to occur, another distractor videotape (or other distracting activity) should be added, which would be followed by another series of lists.

A fourth recommendation of a methodological nature was further testing be done to determine what relative levels of behavioral reinforcement are necessary to overcome the effects of existing practice. In Study 2, the amount of behavioral reinforcement may have been inadequate.

Also discussed in this chapter were two issues of a more conceptual or theoretical nature. First, the data from Study 2 suggest that, in situations where people have not developed habits or habit-like behaviors, demarketing programs that can get people to act as if they had a higher level of involvement will be more effective than demarketing programs that do not. It is not clear that
engaging in two-sided list-making actually increased involvement; perhaps some "pseudo-involvement" (in which people act as if they are involved, but notice no increase in personal relevance) is acting. Investigating the role of involvement and/or pseudo-involvement is a task for future research.

The second theoretical issue concerns the role of motivation. Study 2 is a preliminary empirical exploration of some of the theory developed in Chapter 8 to explain how habitual or habit-like behavior changes. Although motivation plays a prominent role in the theory, this experiment did not attempt to manipulate it. Future research should.

In summary, then, Study 2 shows that habit-like behavior does not respond to change attempts in the same way that non-habit-like behavior does, which is one of the key points of this dissertation. It also raises some new and interesting questions. While some of the findings from this experiment do not coincide with expectations, there are explanations for each unexpected finding that are not inconsistent with the theory presented earlier in this dissertation. It would seem worthwhile to refine both the method and the theory, and to pursue further this research area.
CHAPTER 12
CONCLUSIONS

This chapter summarizes the dissertation research, discusses its implications and contributions, as well as its limitations, and outlines future research directions.

Summary of the Dissertation Research

This research has explored, from a marketing point of view, some issues concerning the question of how to reduce discretionary consumption. This is an issue that has received relatively little research attention, probably due to the fact that countries of the developed world, where most research has been conducted, have generally had economies in a state of excess supply. However, as the United Nations' World Commission on Environment and Development pointed out, global pressure on resources is becoming acute. The Commission recommended that a priority be put on sustainable development, which would require reductions in discretionary consumption of resources, particularly in the developed world, where per capita consumption is many times higher than it is in the developing world.

A review of the marketing literature revealed that, while the usual emphasis has been on issues related to increasing demand, some research has been done on decreasing demand. The term demarketing was coined in the early 1970s, in recognition of the fact that marketing is about more
than building sales volume. Since that time, many studies related to demarketing have been published, including a large number concerned with a specific demarketing issue, energy conservation. Most demarketing studies have been applied in focus and prescriptive in nature. This dissertation research classified demarketing strategies into two groups, "reverse marketing," based on microeconomic theory, and "conventional marketing," based on psychological theories of attitude and behavior change. Neither type of strategy appears to have been particularly successful in achieving sustained reductions in discretionary consumption. In this dissertation research, it was pointed out that the microeconomic and psychological theories on which those strategies were based on a key assumption, namely that the behaviors targeted for change be volitional, and, to the extent that some consumption behaviors are habitual or habit-like (i.e., not completely under volitional control), that assumption is not being met. The remainder of the dissertation explored the implications of conceiving of reducing discretionary consumption as a habit-change problem.

The exploration began with an historical overview of the literature on habits and automated processes, with a particular focus on definitional issues. The concept of habit-like behavior was introduced, defined and described. It was argued that reducing discretionary consumption can often properly be framed as a habit-change problem.

The dissertation then turned to an examination of habit-change strategies. A search of the relevant literature revealed a plethora of ad hoc, habit-specific change strategies, with one notable exception, the Prochaska and DiClemente (P&D) Revolving Door Model of Behavior Change, a "transtheoretical" approach. The P&D model describes how people change habitual and habit-like behaviors, in circumstances that correspond well to the types of demarketing situation of interest in this research — situations in which change entails significant short run costs (not necessarily financial) for uncertain future returns. The Revolving Door Model suggests that people go through several stages of change as they alter their habits. Furthermore, they may cycle through the stages several times before the new behavior becomes well-entrenched in their lives.
The Revolving Door Model of Behavior Change had considerable intuitive appeal as a means of understanding better the processes involved in reducing discretionary consumption, but tests of the model had been confined to clinical situations. Consequently, Study 1, an empirical test, was designed and carried out in an energy conservation context, to determine whether the model would generalize to a typical demarking situation. A telephone survey of 340 customers of B.C. Hydro, an electric utility, gathered data on water temperature used for laundry washing. The study had two goals. The first was to determine whether respondents could be successfully classified into one of the six stages of change in the Revolving Door Model. The second goal was to determine whether key results from past studies of the model would be replicated in a demarking context. Results indicated that it was indeed possible to classify respondents into the stages of change, although the distribution was uneven. Furthermore, although previous results were not replicated perfectly, there were enough points of agreement to suggest that the Revolving Door Model does offer some promise in understanding more fully how to reduce discretionary consumption.

A discussion of the results of Study 1 identified several new research issues, one of which was the need for more theory in the area of habitual and habit-like behavior change. The rest of the dissertation research was devoted to the development and testing of some new theory to explain why and how habitual and habit-like behavior changes.

Based on what is known about habits and habit-like behavior, it was proposed that change can occur in two ways: either pre-emptively, though the inhibition of the trigger(s) that initiate a habitual or habit-like behavior; or by disabling key automated processes underlying the habitual or habit-like behavior. Given the goals and constraints of demarking programs, the disabling approach was judged more practical and desirable. Based on previous theory and findings on automated processes, it was proposed that changing habit-like behavior proceeds in three steps: de-automation, volitional behavior change, and consolidation.
De-automation was defined as the process of bringing under conscious control the automated processes that underlie the habitual or habit-like discretionary consumption behavior. It was proposed that for this to be accomplished the consumer needs a specific description of the habit-like behavior and its underlying automated processes, as well as the ability to reliably anticipate performing the behavior, and the motivation to make the effort required to override the underlying automated processes.

Once de-automation has occurred, and the discretionary consumption behavior is once again under conscious control, volitional behavior change can proceed. This process is already well-understood, and a brief review of the Theory of Reasoned Action was provided. However, in a demarketing context, merely convincing consumers to "sample" reductions in consumption is unlikely to result in sustained changes in behavior, because there is little, if any, immediate positive reinforcement associated with reducing consumption of a desirable resource. It was therefore proposed that an additional step, consolidation, was also necessary.

Consolidation was defined as the repetition of the new behavior to the point that it becomes so well-practised that there is no advantage in terms of cognitive resource use to reverting to excessive consumption. It was pointed out that consolidation requires that consumers have both the motivation and the means to engage in the conservation behavior many times, preferably in a variety of settings.

Study 2 was designed to test some aspects of the three-step model of change. Specifically, in a controlled experiment, two approaches to demarketing (the traditional approach and the habit-change approach) were allowed to compete in two situations (when the consumption behavior targeted for change was new and presumable still under volitional control, and when the consumption behavior had been practised enough to be habit-like). While some results were as hypothesized, there were several unexpected findings. The discussion of those findings recommended several minor methodological changes. In addition, on the theoretical side, it was suggested that the role of
involvement or "pseudo-involvement" and the role of motivation in habit change be investigated explicitly in future research.

Contributions

According to the United Nations World Commission on Environment and Development, sustainable development is an important global goal. Achieving that goal will require, among other things, significant reductions in the consumption of resources by individual consumers in the industrialized nations. This dissertation research does not purport to solve that problem, but it does provide insights into the nature of the problem and proposes new approaches which may contribute to its solution.

The research also adds theoretical, methodological, and practical contributions to marketing knowledge.

Theoretical Contributions. First, this research makes a contribution by specifying the dimensions of the problem underlying many demarketing situations. Previous research on demarketing has implicitly assumed that reducing demand is a variation on the usual marketing problem of increasing demand. But the dissertation research has shown that reducing demand is sometimes a different problem altogether. Most marketing encourages consumers to develop new habits (i.e., to develop brand loyalty); demarketing encourages consumers to break old habits and replace them with new habits. Breaking old habits is considerably more difficult than developing new ones: it often involves convincing consumers to pay what they view as a significant price in the short run (because breaking habits is effortful); to continue to pay that price indefinitely (since new habits often take considerable time to become consolidated); to pay the price despite uncertain returns (as there are no guarantees that the hoped-for result will actually occur); to pay the price even though most of the benefits can only be enjoyed well into the future (because it takes a long time to undo the damage already done); and to pay the price even when people other than those making the
sacrifice will enjoy the benefits (since in many cases demarketing involves public goods). These attributes make reducing demand a more complex challenge than stimulating or increasing it.

Second, this research introduces to the marketing literature useful theory from a discipline not normally considered relevant to marketing: psychotherapy. Marketing has traditionally drawn on psychology and economics to understand how people behave in their roles as consumers. Psychotherapy, a clinical discipline, is a field that has attracted little interest from researchers in marketing. But, as this research has demonstrated, marketing and psychotherapy are not as far apart as they might initially seem. They share a common foundation discipline, psychology, and an applied focus. As well, they share the goal of encouraging people to change their behaviors in ways that will make them become happier and more productive members of society. Finally, psychotherapy often addresses problems that arise from habitual behaviors — exactly the kind of behavior that is of interest in the case of demarketing. Clearly, some of the therapeutic insights from *The Revolving Door Model of Behavior change* are transferable to the demarketing context, although some adaptation to the constraints of the market are necessary. Other marketing problems may also benefit from the new perspective provided by psychotherapy.

Third, this research adds to the Revolving Door Model of Behavior Change by proposing a more multi-dimensional, flexible set of stage definitions.

Finally, this research suggests that the demarketing problem is not a single problem, but a series of problems. The research develops a new model of habitual or habit-like behavior change, with three components: de-automation, volitional behavior change, and consolidation. Of these sub-problems, only volitional behavior change is well-understood. This decomposition will allow researchers to focus on de-automation and consolidation, which is where the real challenge lies. The development of effective demarketing strategies will require a deeper understanding of de-automation and consolidation.
Methodological Contribution. The experimental procedure used in this dissertation research captures the essential characteristics of demarketing situations that involve discretionary consumption.

First, in many such situations, people become accustomed to using the resource wastefully. While there may originally have been good reasons for using the resource in large quantities, those good reasons have become obsolete (at least from the demarketer's point of view). In this experimental procedure, participants quickly became used to using only one side of the paper, rather than both sides.

Second, in many discretionary consumption situations, the resource is not of central concern to the participant; it is merely a means to an end. In fact, it may be taken completely for granted. In this experimental procedure, a cover story was used to lead participants to believe that they were involved in a study of how the organization of requests for information affects memory for that information; the paper was just a resource they needed to complete the tasks assigned.

Third, in many discretionary consumption situations, changing the behavior is costly, though not necessarily in financial terms. In this experimental procedure, participants were under some time pressure, they were instructed to keep their work organized chronologically, and they knew that they would have to be able to locate specific lists quickly; this was not as easy to do when two sides of the paper were used instead of one.

Fourth, in many discretionary consumption situations, changing the behavior often has uncertain returns that will accrue far in the future, frequently to people other than those making the effort. In this experimental procedure, there was no clear benefit (with respect to the task being performed) to using two sides of the paper, other than it was the "right" thing to do.

Finally, in many discretionary consumption situations, the reasons for changing the behavior are not immediately evident. In this experimental procedure, there was plenty of paper in full view; it was clear that there was no immediate danger of running out. The only reason participants would conserve paper is because it is the "right" thing to do.
Any research that investigates causal relationships requires the controlled conditions of an experiment. Studying behavior of this sort under the controlled conditions of a laboratory experiment has not previously been attempted. This procedure emulates the essential characteristics of some demarketing situations, and is flexible enough to be adapted to study various variables of interest.

**Practical/Managerial Implications.** This research suggests that managers involved in the design and implementation of demarketing programs that concern reducing discretionary consumption should recognize that neither reverse marketing nor the usual persuasive approaches are likely to be effective. This realization may help prevent investment in marketing programs that are unlikely to be effective in achieving sustained behavior change.

In addition, this research suggests that consideration should be given to segmenting the target market for demarketing programs by stage of change. People in different stages of change have different goals, attitudes, cognitions, and behaviors concerning both the undesirable and the desirable behaviors. People in different stages would probably respond better to different marketing strategies.

**Limitations**

This dissertation research was exploratory. Its purpose was to better define some issues surrounding the reduction of discretionary consumption, and to begin to address a subset of those issues. It has several limitations.

**Theoretical Limitations.** The scope of this research was limited. It concerned habit-like discretionary consumption, where "discretionary" and "excessive" are a matter of judgement by the demarker. It is not applicable to discretionary consumption that is volitional, nor to non-discretionary consumption. Moreover, the research examined only some of the possible variables that might influence reductions in discretionary consumption. For instance, the role of involvement was not investigated. Such variables might increase explanatory power.
Limitations of Study 1. There were several methodological limitations to Study 1. First, only one conservation behavior, cold water washing, was studied. This behavior was chosen to satisfy three criteria: that it had to have been the object of a demarketing program; that past demarketing programs had to have focused on changes in usage behavior, rather than changes in purchasing behavior; and that accurate self-reports concerning the behavior had to be relatively easy to make. These criteria were chosen for ease of measurement, and reduced considerably the pool of behaviors that were candidates for Study 1. The findings of Study 1 cannot be generalized to other behaviors with different characteristics without further study.

Second, Study 1 used a cross-sectional design to study a dynamic model. As a consequence, no implications can be drawn concerning the movement between stages.

Third, residents of British Columbia were sampled. Environmental awareness and/or concern may be greater in B.C. than other areas of the industrialized world, due to the province’s natural beauty and the importance of tourism to the economy. To the extent that British Columbians are more concerned with environmental issues, particularly conservation issues, the findings of Study 1 should not be generalized to other groups.

Limitations of Study 2. Study 2 was a laboratory experiment. Participants knew that they were participating in an experiment. Although the cover story seems to have been successful in the sense that, when asked, none of the participants knew what the real purpose of the study was. However, accepting the cover story does not necessarily mean that the participants were acting naturally. Virtually all of the students who participated in his experiment have taken (at least) an introductory psychology course, so many of them may not have acted exactly the same way they would have if they had not known they were participating in an experiment. Consequently, caution should be used in extending findings from Study 2 to other situations.

Another limitation of Study 2 concerns the sample used. All participants were students at Memorial University of Newfoundland, and the vast majority were born and brought up in
Newfoundland. Many Newfoundlanders believe that their history and culture makes them distinct from the rest of Canada and North America. To the extent that this claim is accurate, and that such distinctness would affect propensity to switch from using one side of the paper to using both sides, the sample may not be generalizable to a wider population.

In addition, most participants were undergraduate Business students or undergraduate Business minors. They were, therefore, younger than the general population, better educated than much of the general population, and would have had a more business-oriented view of the world than would the general population. All these characteristics limit generalizability.

A third limitation concerns the task used. The list-making task was designed to capture the essential characteristics of a class of discretionary consumption situations (see Chapter 9). The findings cannot be generalized to discretionary consumption situations that do not possess those characteristics.

A fourth limitation concerns the choice of variables manipulated and/or measured. At this early stage of understanding of discretionary consumption, not all relevant variables can be manipulated or measured. For instance, one important variable, motivation, was neither manipulated or measured directly. The findings do not, therefore, take into account the roles of unmanipulated or unmeasured variables.

Finally, methodological weaknesses in Study 2 (as discussed in Chapter 11) impose limits on conclusions that can be drawn. These weaknesses can be overcome in future research.

Future Research Directions

This dissertation research has raised several issues that merit future research attention. Chapters 7 and 11 discuss those issues in detail, but a brief summary is provided here.

Transferring the Revolving Door Model from clinical settings to a demarketing context was not particularly difficult, but it did identify some problems and raise some questions for future study.
The first concern is the definitions used to classify respondents into the stages of change. The definitions were successful in the sense that most respondents (almost 95%) were classified, but the operational definitions may have been too rigid. A more flexible and multidimensional approach to defining the stages was proposed in Chapter 7. The utility of these definitions should be tested. They should also be further elaborated to take into account the effect of experience as people cycle through the stages of change.

A second issue arising from Study 1 is the difficulty of testing a model of behavior change using the "snapshot" of a cross-sectional study. As Chapter 7 explains, future research could measure the transition probabilities across the various stages of change, which could identify bottlenecks and be used as a basis for evaluating the effectiveness of demarketing programs.

A third issue arising from Study 1 is the fact that the stages of change are really discrete approximations of a continuous process, and that there is change within a stage. Future research should address the need for more continuous measures of the stages of change.

The fourth, and most important, issue raised in Study 1 is the need for more theory in this area. The theory developed in Chapter 8 begins to address this need, but more theoretical work needs to be done to fully understand the problem of reducing discretionary consumption in order to be able to design effective marketing programs.

As noted earlier, Study 2 raised several new questions worthy of research attention. First, the experimental procedure was, in many ways, a success in emulating the essential characteristics of typical demarketing situations. However, improvements are undoubtedly possible and desirable. Several of them are suggested in Chapter 11. Future research should refine the procedure further.

Second, the role of involvement and, if it exists, pseudo-involvement should be investigated. The results of Study 2 suggest that demarketing programs that can get people to act as if they had a higher level of involvement will be more effective than demarketing programs that do not. It is up to future research to explain why that might be.
Third, it is important that the role of motivation in habitual or habit-like behavior change be examined. The theory developed in Chapter 8 discussed the role of motivation in both de-automation and consolidation, but the variable was not chosen for either manipulation or measurement in Study 2.

Future research should also broaden the behavioral focus. This research examined only two behaviors, cold water washing and using both sides of the paper. There are many other demarketing situations that could be investigated.

Finally, the Revolving Door Model of Behavior Change describes behavior on an individual level. At a population level, the model may not be as powerful, since the people in a given stage of change may be in it for the first time, the second time, or the nth time, and these varying levels of experience may affect attitudes, beliefs, intentions, reactions, and behaviors. Future research should address this levels of analysis issue.

Conclusion

The topic of this dissertation, reducing discretionary consumption, is an important issue socially, economically, and politically. It is also interesting from a marketing point of view, because it is an unusual problem, with a set of attributes that diverges from the problems and issues usually investigated in marketing research.

The research reported in this dissertation has not solved all the problems or answered all the questions surrounding the issue. Indeed, it has raised a number of new and interesting questions. But this research has also increased understanding of the issue, through careful specification of the problem, critical examination of existing research, application of an interesting approach from a different discipline, and the development of new theory.
APPENDIX 1
BC HYDRO TRACKING SURVEY
Wave 7
B.C. HYDRO TRACKING STUDY  
Wave 7

Good afternoon/evening, my name is ______. I’m calling from Mark Trend, a marketing research firm. Today we are conducting a survey among residents of British Columbia about utility companies. May I please speak with the (ROTATE) male/female head of your household?

**IF OTHER THAN PERSON TO WHOM YOU ARE SPEAKING, RE-INTRODUCE AND CONFIRM HOUSEHOLD POSITION.**

**IN LOWER MAINLAND ONLY: (READ SLOWLY)** Throughout this interview whenever we are asking about B.C. Hydro, please think only of electricity. Gas service is now the responsibility of B.C. Gas, a separate company.

Thinking about British Columbian utility companies ...

1. Have you seen or heard any advertising recently by ______?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>DK/Ref</th>
</tr>
</thead>
<tbody>
<tr>
<td>H.C. Hydro</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>B.C. Tel</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Your local gas company</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Cablevision</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

**IF HYDRO RECALLED, ASK:**

2. Have you seen any B.C. Hydro advertising on television recently?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>GO TO Q.4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

3. Please describe everything you remember about the B.C. Hydro television advertising. **PROBE:** Anything else?

4. Have you seen or heard any advertising recently by B.C. Hydro about the province’s future electricity needs or how to use electricity efficiently?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>GO TO Q.7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Don’t know/refused</th>
<th>GO TO Q.7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>
5. In which of the following media do you recall seeing or hearing this advertising by B.C. Hydro? READ LIST.

<table>
<thead>
<tr>
<th>Medium</th>
<th>Yes</th>
<th>No</th>
<th>DK/Ref</th>
</tr>
</thead>
<tbody>
<tr>
<td>Television</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Radio</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Newspaper</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Magazine</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Billboard</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Bill inserts</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Brochures (other than inserts)</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Public displays or trade shows</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

FOR EACH MEDIUM MENTIONED, ASK:

6a-h Please tell me everything you remember about this _____ advertising. (PROBE) Anything else?

7. Do you recall seeing any television programs or newspaper articles recently promoting the efficient use of electricity?

<table>
<thead>
<tr>
<th>Response</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td>Don't know/refused</td>
<td>3</td>
</tr>
</tbody>
</table>

8. What slogans do you recall being used by B.C. Hydro recently? DO NOT READ.

<table>
<thead>
<tr>
<th>Slogan</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Smart</td>
<td>1</td>
</tr>
<tr>
<td>Proud of Our Service</td>
<td>2</td>
</tr>
<tr>
<td>Pulling the Plug on Energy Waste</td>
<td>3</td>
</tr>
<tr>
<td>Other (specify)</td>
<td>4</td>
</tr>
<tr>
<td>None/don’t know</td>
<td>5</td>
</tr>
</tbody>
</table>

9. And what is the name of B.C. Hydro’s energy conservation program? DO NOT READ.

<table>
<thead>
<tr>
<th>Program</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Smart</td>
<td>1</td>
</tr>
<tr>
<td>Other (specify)</td>
<td>2</td>
</tr>
<tr>
<td>Don’t know</td>
<td>3</td>
</tr>
</tbody>
</table>

FOR EACH NOT MENTIONED IN Q.8 OR Q.9 ASK:

10. Do you recall any of the following phrases being used by B.C. Hydro?

<table>
<thead>
<tr>
<th>Phrase</th>
<th>Yes</th>
<th>No</th>
<th>DK/Ref</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Smart</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Proud of Our Service</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Pull the Plug on Energy Waste</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
11. Have you purchased a new fridge since June of last year?
   Yes 1
   No 2
   Don’t know/refused 3

12. Have you heard of a program by B.C. Hydro that offers a $50 rebate to anyone purchasing selected energy efficient fridges?
   Yes 1
   No 2  GO TO Q.17
   Don’t know/refused 3  GO TO Q.17

IF NOT BOUGHT FRIDGE (Q.11) GO TO Q.15

13. Did the fridge you purchased qualify for the B.C. Hydro rebate program?
   Yes 1
   No 2  GO TO Q.15
   Don’t know/refused 3  GO TO Q.15

14. Did you apply to receive the $50 rebate?
   Yes 1
   No 2
   Don’t know/refused 3

15. Where did you first learn about this rebate program for energy fridges? DO NOT READ.
   Television 1
   Radio 2
   Newspaper 3
   Magazine 4
   Billboard 5
   Bill inserts 6
   Friend/relative/word of mouth 7
   Point of sale/in store/salesperson 8
   Public display/trade show 9
   Other (specify) ______ 10
   Can’t recall 11

IF ADVERTISING NOT RECALLED (CODES 1-6), ASK:

16. Do you remember seeing an advertisement by B.C. Hydro recently about this rebate program for energy efficient fridges?
   Yes 1
   No 2
   Don’t know/refused 3
IF "ISLAND" GO TO Q.24

17. Is natural gas available in your neighbourhood?

<table>
<thead>
<tr>
<th>Yes</th>
<th>1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>2</td>
<td>GO TO Q.24</td>
</tr>
<tr>
<td>Don't know/refused</td>
<td>3</td>
<td>GO TO Q.24</td>
</tr>
</tbody>
</table>

18. Have you replaced an electric water heater with a natural gas heater since June of last year?

<table>
<thead>
<tr>
<th>Yes</th>
<th>1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Don't know/refused</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

19. Have you heard of a joint program by B.C. Hydro and natural gas companies that offers a rebate of approximately $150 to anyone replacing an electric water heater with a natural gas heater?

<table>
<thead>
<tr>
<th>Yes</th>
<th>1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>2</td>
<td>GO TO Q.24</td>
</tr>
<tr>
<td>Don't know/refused</td>
<td>3</td>
<td>GO TO Q.24</td>
</tr>
</tbody>
</table>

IF NOT REPLACED HEATER (Q.18), GO TO Q.22

20. Did the water heater you purchased qualify for the B.C. Hydro rebate program?

<table>
<thead>
<tr>
<th>Yes</th>
<th>1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>2</td>
<td>GO TO Q.22</td>
</tr>
<tr>
<td>Don't know/refused</td>
<td>3</td>
<td>GO TO Q.22</td>
</tr>
</tbody>
</table>

21. Did you apply to receive the $150 rebate?

<table>
<thead>
<tr>
<th>Yes</th>
<th>1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Don't know/refused</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>
22. Where did you first learn about this rebate program for replacing electric water heaters with natural gas? **DO NOT READ.**

- Television 1
- Radio 2
- Newspaper 3
- Magazine 4
- Billboards 5
- Bill inserts 6
- Friend/relative/word of mouth 7
- Point of sale/in store/salesman/tradesman 8
- Public display/trade show 9
- Other (specify) 10
- Can’t recall 11

**IF ADVERTISING NOT RECALLED (CODES 1-6), ASK:**

23. Do you remember seeing an advertisement by B.C. Hydro recently about this rebate program for replacing electric water heaters with natural gas?

- Yes 1
- No 2
- Don’t know/refused 3

24. Have you purchased an electric water heater since June of last year?

- Yes 1
- No 2
- Don’t know/refused 3

25. Have you heard of a program by B.C. Hydro that offers a $20 rebate to anyone purchasing an energy efficient electric water heater?

- Yes 1
- No 2\n  \* GO TO Q.30
- Don’t know/refused 3\n  \* GO TO Q.30

**IF NOT BOUGHT ELECTRIC HEATER (Q.24) GO TO Q.28**

26. Did the water heater you purchased qualify for the B.C. Hydro rebate program?

- Yes 1
- No 2\n  \* GO TO Q.28
- Don’t know/refused 3\n  \* GO TO Q.28

27. Did you apply to receive the $20 rebate?

- Yes 1
- No 2
- Don’t know/refused 3
28. Where did you first learn about this rebate program for energy efficient water heaters? DO NOT READ.

Television 1
Radio 2
Newspaper 3
Magazine 4
Billboard 5
Bill inserts 6
Friend/relative/word of mouth 7
Point of sale/in store/salesperson/tradesman 8
Public display/trade show 9
Other (specify) ______ 10
Can’t recall 11

IF ADVERTISING NOT RECALLED (CODES 1-6), ASK:

29. Do you remember seeing an advertisement by B.C. Hydro recently about this rebate program for energy efficient water heaters?

Yes 1
No 2
Don’t know/refused 3

30. Have you purchased a newly built home since June of last year?

Yes 1
No 2
Don’t know/refused 3

31. Have you heard of a joint program by B.C. Hydro and the Canadian Home Builders Association of B.C. for "Quality Plus Homes"?

Yes 1
No 2 GO TO Q.34
Don’t know/refused 3 GO TO Q.34

32. Where did you first learn about the "Quality Plus Home" program? DO NOT READ.

Television 1
Radio 2
Newspaper 3
Magazine 4
Billboard 5
Bill inserts 6
Friend/relative/word of mouth 7
Point of sale/realtor 8
Public display/trade show 9
Other (specify) ______ 10
Can’t recall 11
IF ADVERTISING NOT RECALLED (CODES 1-6), ASK:

33. Do you remember seeing an advertisement by B.C. Hydro recently about "Quality Plus Homes"?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td>Don't know/refused</td>
<td>3</td>
</tr>
</tbody>
</table>

34. Do you recall seeing a B.C. Hydro advertisement recently promoting the use of compact fluorescent lighting in the home?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td>Don't know/refused</td>
<td>3</td>
</tr>
</tbody>
</table>

35. Thinking about your own lifestyle and the way you use electricity, how would you rate yourself on a scale of one to ten, where a rating of "1" means you do not pay much attention to the amount of electricity you use, up to "10" which means you pay very close attention to trying to limit the amount of electricity you use?

36a. IF RATED 7-10, ASK.
What is your primary reason for limiting the amount of electricity that you use? DO NOT READ. ONE REPLY.

<table>
<thead>
<tr>
<th>Reason</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Help preserve the environment</td>
<td>1</td>
</tr>
<tr>
<td>Eliminate waste/not to waste electricity</td>
<td>2</td>
</tr>
<tr>
<td>To save money</td>
<td>3</td>
</tr>
<tr>
<td>It is the sensible thing to do</td>
<td>4</td>
</tr>
<tr>
<td>To ensure the future energy supply</td>
<td>5</td>
</tr>
<tr>
<td>Other (specify) ______</td>
<td>6</td>
</tr>
<tr>
<td>No reason/don't know</td>
<td>7</td>
</tr>
</tbody>
</table>

IF RATED 1-6, ASK:

b. What is your primary reason for not paying a lot of attention to the amount of electricity that you use? DO NOT READ. ONE REPLY.

<table>
<thead>
<tr>
<th>Reason</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Habit/just never have</td>
<td>1</td>
</tr>
<tr>
<td>No need/have enough/a surplus</td>
<td>2</td>
</tr>
<tr>
<td>Savings are too small to bother</td>
<td>3</td>
</tr>
<tr>
<td>Other (specify) ______</td>
<td>4</td>
</tr>
<tr>
<td>No reason/don't know</td>
<td>5</td>
</tr>
</tbody>
</table>
37. Lately, would you say you and your family are paying more attention, less attention, or no more or less attention than a year or two ago to conserving electricity or using electricity wisely? IF MORE OR LESS, ASK: Is that a lot more/less or a little more/less?

A lot more 1
A little more 2
No more or less 3
A little less 4
A lot less 5
Don’t know/refused 6

38. Why do you think B.C. Hydro would be encouraging people to use electricity more efficiently? DO NOT READ. PROBE: Anything else?

Delay building new dams 1
Help the environment (general) 2
To sell power to the U.S. 3
To save Hydro money 4
Other (specify) 5
Don’t know/not sure 6

39. I have some questions about the way your household does laundry. Are you the person responsible for doing the laundry in your household?

Yes 1
No 2  GO TO Q.67

40. Do you do your laundry in your own home, in a shared laundry room, or at a laundromat?

In own home 1
Shared laundry room 2
Laundromat 3

41. How many loads of laundry does your household wash in an average week?

__ Loads
Don’t know 99  GO TO Q.67
42. How many of these ___ loads are done using . . . ? READ LIST.

Cold water wash and cold water rinse ___
Warm water wash and cold water rinse ___
Warm water wash and warm water rinse ___
Hot water wash and cold water rinse ___
Hot water wash and warm or hot water rinse ___
Any other combination (specify)

IF ONE OR MORE LOADS DONE USING COLD WATER AND COLD WATER RINSE GO TO Q.46

43. Thinking back to an average week six months ago, were you doing any loads of laundry using cold water wash and cold water rinse?

Yes 1
No 2
Can’t recall 3

44. Now thinking ahead six months, do you think you will be doing any loads of laundry using cold water wash and cold water rinse?

Yes 1
No 2
Don’t know/can’t say 3

45. Why do you prefer warm or hot water for doing laundry? DO NOT READ.

Habit/always used warm/hot 1
Gets laundry cleaner/detergent works better 2
More sanitary/kills germs 3
Detergent dissolves better 4
Detergent rinses out better 5
Takes less time in the dryer 6
Other (specify) 7

No reason/don’t know 8

GO TO Q.48

46. Compared with six months ago, are you now doing more, less, or about the same amount of your household’s laundry using cold water wash and cold water rinse?

More 1
Less 2
Same amount 3
Can’t recall 4
47. Why do you use cold water for doing laundry? **DO NOT READ. PROBE:** Any other reasons?

<table>
<thead>
<tr>
<th>Reason</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Habit/always used</td>
<td>1</td>
</tr>
<tr>
<td>Better for/helps the environment</td>
<td>2</td>
</tr>
<tr>
<td>Saves money/cheaper</td>
<td>3</td>
</tr>
<tr>
<td>Easier on/less damaging to fabrics</td>
<td>4</td>
</tr>
<tr>
<td>Prevents fading of colours</td>
<td>5</td>
</tr>
<tr>
<td>Colours don’t run</td>
<td>6</td>
</tr>
<tr>
<td>Prevents shrinking</td>
<td>7</td>
</tr>
<tr>
<td>Other (specify)</td>
<td>8</td>
</tr>
<tr>
<td>No reason/don’t know</td>
<td>9</td>
</tr>
</tbody>
</table>

I am now going to ask you some questions about how important different factors are in your decision about what water temperature to use when you do laundry. Please rate each factor between one and five, where a rating of "1" means you think the factor is not at all important up to "5" which means you think the factor is very important. If you do not agree with what the statement is saying, you can tell me that also.

How important to you personally is it that...? **READ STATEMENT. ROTATE.**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Not Imp</th>
<th>Very Imp</th>
<th>Don’t Agree</th>
<th>Agree</th>
<th>DK</th>
</tr>
</thead>
<tbody>
<tr>
<td>48. Washing in cold water saves energy</td>
<td>1 2 3 4</td>
<td>5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>49. Some detergents dissolve better in hot water</td>
<td>1 2 3 4</td>
<td>5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50. Hot water kills germs better than cold water does</td>
<td>1 2 3 4</td>
<td>5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>51. Cold water is less harmful to fabrics</td>
<td>1 2 3 4</td>
<td>5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>52. Washing in cold water keeps colours bright</td>
<td>1 2 3 4</td>
<td>5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>53. Washing in cold water prevents clothes from shrinking</td>
<td>1 2 3 4</td>
<td>5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>54. Hot water is more effective at removing stains</td>
<td>1 2 3 4</td>
<td>5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55. Washing in cold water saves money</td>
<td>1 2 3 4</td>
<td>5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
56. Laundry washed in hot water looks cleaner 1 2 3 4 5 6 7
57. Some detergents rinse out better in hot water 1 2 3 4 5 6 7
58. Washing in cold water helps protect the environment 1 2 3 4 5 6 7
59. Detergents made especially for cold water use work as well as other detergents work in hot water 1 2 3 4 5 6 7
60. Laundry rinsed in hot water dries faster in the dryer 1 2 3 4 5 6 7
61. Cold water prevents colours from running 1 2 3 4 5 6 7
62. For all but really tough stains, cold water gets laundry clean 1 2 3 4 5 6 7
63. Doing laundry in cold water conserves hot water 1 2 3 4 5 6 7
64. Washing in hot water keeps light colours from becoming dull and dingy looking 1 2 3 4 5 6 7
65. Some detergents work better in hot water 1 2 3 4 5 6 7
66. Hot water reduces the need for bleach and other laundry additives 1 2 3 4 5 6 7

67. Now a few questions about billing. Is your household enrolled in any of the following Hydro billing plans? READ LIST.

<table>
<thead>
<tr>
<th>Plan</th>
<th>Yes</th>
<th>No</th>
<th>DK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equal Payment Plan (Budget Billing)</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Pre-Authorized Payment Plan</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Advanced Billing Discount Plan</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

IF ENROLLED IN ANY PLAN (Q.67) GO TO Q.69
68. Why is it that you are not currently enrolled in a Hydro payment plan? PROBE FULLY FOR OTHER REASONS AND SPECIFICS.

69a. Thinking in general terms, to what extent has concern about the environment led you to modify the way you live and the actions you take? Have you made...? READ LIST.

Very many changes 1
Some changes 2
A few changes 3
Or
No real changes 4 GO TO Q.70

DO NOT READ
Don’t know 5 GO TO Q.70

b. What specific changes have you made? DO NOT READ.

Buy environmentally friendly products 1
Buy products with less packaging 2
Recycle - glass/newspaper/plastic etc. 3
Drive less/take transit/walk/ride bike 4
Conserve electricity/use wisely/efficiently 5
Compost food/garden waste 6
Other (specify) __________ 7
None in particular 8

70. What is the main source of heating for your home? IF GAS, ASK: Is that natural gas or propane?

Natural gas 1
Propane 2
Gas (unspecified) 3
Oil 4
Electricity 5
Wood 6
Other (specify) ______ 7
Don’t know/refused 8

71. What other sources of heating are used for your home? IF GAS, ASK: Is that natural gas or propane?

Natural gas 1
Propane 2
Gas (unspecified) 3
Oil 4
Electricity 5
Wood 6
Other (specify) ______ 7
Don’t know/refused 8
72. And what type of heater supplies your home's hot water? **IF GAS, ASK:** Is that natural gas or propane?

<table>
<thead>
<tr>
<th>Option</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural gas</td>
<td>1</td>
</tr>
<tr>
<td>Propane</td>
<td>2</td>
</tr>
<tr>
<td>Gas (unspecified)</td>
<td>3</td>
</tr>
<tr>
<td>Oil</td>
<td>4</td>
</tr>
<tr>
<td>Electricity</td>
<td>5</td>
</tr>
<tr>
<td>Wood</td>
<td>6</td>
</tr>
<tr>
<td>Other (specify)</td>
<td>7</td>
</tr>
<tr>
<td>Don't know/refused</td>
<td>8</td>
</tr>
</tbody>
</table>

**IF ELECTRICITY IN Q.72, ASK:**

73a. Is your water heater wrapped with an extra fiberglass insulation jacket or blanket in addition to its original insulation?

<table>
<thead>
<tr>
<th>Option</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td>Don't know</td>
<td>3</td>
</tr>
</tbody>
</table>

**GO TO Q.74**

b. Did you purchase the jacket yourself or was it supplied by B.C. Hydro?

<table>
<thead>
<tr>
<th>Option</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchased</td>
<td>1</td>
</tr>
<tr>
<td>Supplied by Hydro</td>
<td>2</td>
</tr>
<tr>
<td>Don’t know/refused</td>
<td>3</td>
</tr>
</tbody>
</table>

**GO TO Q.74**

74. Compact fluorescent lights are small fluorescent tubes that can be used in regular light fixtures instead of regular light bulbs. How many, if any, compact fluorescent lights are being used in your home?

75. Do you own your current home or are you presently renting?

<table>
<thead>
<tr>
<th>Option</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own</td>
<td>1</td>
</tr>
<tr>
<td>Rent</td>
<td>2</td>
</tr>
<tr>
<td>Don't know/refused</td>
<td>3</td>
</tr>
</tbody>
</table>

76. What type of dwelling do you live in? **DO NOT READ.**

<table>
<thead>
<tr>
<th>Option</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single family home</td>
<td>1</td>
</tr>
<tr>
<td>Duplex (2 units attached)</td>
<td>2</td>
</tr>
<tr>
<td>Townhouse or rowhouse</td>
<td>3</td>
</tr>
<tr>
<td>Apartment</td>
<td>4</td>
</tr>
<tr>
<td>Mobile home</td>
<td>5</td>
</tr>
<tr>
<td>Other (specify)</td>
<td>6</td>
</tr>
<tr>
<td>Refused</td>
<td>7</td>
</tr>
</tbody>
</table>
77. And what is the total square footage of your home, including any basement or unfinished areas? **IF ANSWER GIVEN IN SQUARE METRES, MULTIPLY BY THREE.**

____________________ Square Feet

78. Including yourself, how many people are there in your household?

<table>
<thead>
<tr>
<th>Number of People</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>1</td>
</tr>
<tr>
<td>Two</td>
<td>2</td>
</tr>
<tr>
<td>Three</td>
<td>3</td>
</tr>
<tr>
<td>Four</td>
<td>4</td>
</tr>
<tr>
<td>Five or more</td>
<td>5</td>
</tr>
<tr>
<td>Refused</td>
<td>6</td>
</tr>
</tbody>
</table>

79. How many children under the age of six are there in your household?

<table>
<thead>
<tr>
<th>Number of Children</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>1</td>
</tr>
<tr>
<td>One</td>
<td>2</td>
</tr>
<tr>
<td>Two</td>
<td>3</td>
</tr>
<tr>
<td>Three or more</td>
<td>4</td>
</tr>
<tr>
<td>Refused</td>
<td>5</td>
</tr>
</tbody>
</table>

80. Into which of the following categories does your age fall? **READ LIST.**

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 18</td>
<td>1</td>
</tr>
<tr>
<td>18-24</td>
<td>2</td>
</tr>
<tr>
<td>25-29</td>
<td>3</td>
</tr>
<tr>
<td>30-34</td>
<td>4</td>
</tr>
<tr>
<td>35-39</td>
<td>5</td>
</tr>
<tr>
<td>40-44</td>
<td>6</td>
</tr>
<tr>
<td>45-49</td>
<td>7</td>
</tr>
<tr>
<td>50-54</td>
<td>8</td>
</tr>
<tr>
<td>55-59</td>
<td>9</td>
</tr>
<tr>
<td>60-64</td>
<td>10</td>
</tr>
<tr>
<td>65 or older</td>
<td>11</td>
</tr>
</tbody>
</table>

**DO NOT READ**

Refused 12

53. Which of the following describes your educational background? **READ LIST.**

<table>
<thead>
<tr>
<th>Educational Background</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Some high school or less</td>
<td>1</td>
</tr>
<tr>
<td>Completed high school</td>
<td>2</td>
</tr>
<tr>
<td>College/technical school</td>
<td>3</td>
</tr>
<tr>
<td>Some university</td>
<td>4</td>
</tr>
<tr>
<td>or Completed university</td>
<td>5</td>
</tr>
</tbody>
</table>

**DO NOT READ**

Refused 6
81. **INDICATE GENDER.**

<table>
<thead>
<tr>
<th>Gender</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>1</td>
</tr>
<tr>
<td>Female</td>
<td>2</td>
</tr>
</tbody>
</table>

82. Finally, which of the following best describes your total household income before taxes for 1990? **READ LIST.**

<table>
<thead>
<tr>
<th>Income Range</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $20,000</td>
<td>1</td>
</tr>
<tr>
<td>$20,000 to $29,000</td>
<td>2</td>
</tr>
<tr>
<td>$30,000 to $39,000</td>
<td>3</td>
</tr>
<tr>
<td>$40,000 to $49,000</td>
<td>4</td>
</tr>
<tr>
<td>$50,000 to $59,000</td>
<td>5</td>
</tr>
<tr>
<td>$60,000 or more</td>
<td>6</td>
</tr>
<tr>
<td>Don't know/refused</td>
<td>7</td>
</tr>
</tbody>
</table>

Thank you very much for your time and cooperation.
APPENDIX 2:
MATERIALS FOR PARTICIPANTS IN STUDY 2
APPENDIX 2a:
Information Sheet for:
Participants with Little Premanipulation Practice
Receiving the Persuasion Manipulation
and
Participants with Little Premanipulation Practice
Receiving No Manipulation (Control)
INFORMATION ABOUT THIS STUDY

Thank you for participating in this study. It involves making lists of everyday facts under various circumstances, and should take about 60 minutes of your time.

What Will Happen in this Study

First, you will make five different lists. For each list, the administrator will read out a category and you will have 30 seconds to write down all the items you can think of that would fit into that category. Then, you will watch a videotape about memory. After that, we will give your memory a break and show you a short, entertaining videotape. Then you will make 30 more lists. Finally, we will ask you to fill out a short questionnaire.

Other Information

You may, of course, withdraw from the study at any time without penalty. Your participation is anonymous. All data collected will be treated as confidential.

If you have any questions or concerns about this research project, please contact Professor Katherine Gallagher, Faculty of Business Administration, or the Research Committee, Faculty of Business Administration, Memorial University of Newfoundland.

Once again, thank you very much for participating in this study. Please take a few moments now to read and sign the consent form.
APPENDIX 2b:
Information Sheet for:
Participants with Little Premanipulation Practice
Receiving the Persuasion + Behavior Manipulation
INFORMATION ABOUT THIS STUDY

Thank you for participating in this study. It involves making lists of everyday facts under various circumstances, and should take about 60 minutes of your time.

What Will Happen in this Study

First, you will make five different lists. For each list, the administrator will read out a category and you will have 30 seconds to write down all the items you can think of that would fit into that category. Then, you will watch a videotape about memory and make 15 more lists while you watch the tape. After that, we will give your memory a break and show you a short, entertaining videotape. Then you will make 30 more lists. Finally, we will ask you to fill out a short questionnaire.

Other Information

You may, of course, withdraw from the study at any time without penalty. Your participation is anonymous. All data collected will be treated as confidential.

If you have any questions or concerns about this research project, please contact Professor Katherine Gallagher, Faculty of Business Administration, or the Research Committee, Faculty of Business Administration, Memorial University of Newfoundland.

Once again, thank you very much for participating in this study. Please take a few moments now to read and sign the consent form.
APPENDIX 2c:
Information Sheet for:
Participants with Extensive Premanipulation Practice
Receiving the Persuasion Manipulation
INFORMATION ABOUT THIS STUDY

Thank you for participating in this study. It involves making lists of everyday facts under various circumstances, and should take about 90 minutes of your time.

What Will Happen in this Study

First, you will make 30 different lists. For each list, the administrator will read out a category and you will have 30 seconds to write down all the items you can think of that would fit into that category. Then, you will watch a videotape about memory. After that, we will give your memory a break and show you a short, entertaining videotape. Then you will make 30 more lists. Finally, we will ask you to fill out a short questionnaire.

Other Information

You may, of course, withdraw from the study at any time without penalty. Your participation is anonymous. All data collected will be treated as confidential.

If you have any questions or concerns about this research project, please contact Professor Katherine Gallagher, Faculty of Business Administration, or the Research Committee, Faculty of Business Administration, Memorial University of Newfoundland.

Once again, thank you very much for participating in this study. Please take a few moments now to read and sign the consent form.
APPENDIX 2d:
Information Sheet for:
Participants with Extensive Premanipulation Practice
Receiving the Persuasion + Behavior Manipulation
INFORMATION ABOUT THIS STUDY

Thank you for participating in this study. It involves making lists of everyday facts under various circumstances, and should take about 90 minutes of your time.

What Will Happen in this Study

First, you will make 30 different lists. For each list, the administrator will read out a category and you will have 30 seconds to write down all the items you can think of that would fit into that category. Then, you will watch a videotape about memory and make 15 more lists while you watch the tape. After that, we will give your memory a break and show you a short, entertaining videotape. Then you will make 30 more lists. Finally, we will ask you to fill out a short questionnaire.

Other Information

You may, of course, withdraw from the study at any time without penalty. Your participation is anonymous. All data collected will be treated as confidential.

If you have any questions or concerns about this research project, please contact Professor Katherine Gallagher, Faculty of Business Administration, or the Research Committee, Faculty of Business Administration, Memorial University of Newfoundland.

Once again, thank you very much for participating in this study. Please take a few moments now to read and sign the consent form.
APPENDIX 2e:
Consent Form for:
All Participants
CONSENT FORM

To: Professor Katherine Gallagher
   Faculty of Business Administration
   Memorial University of Newfoundland

RE: Study on Making Lists

I have read the accompanying information sheet and agree to participate in this study. I understand that I may withdraw from the study at any time without penalty. I also understand that my participation is anonymous and all information collected will be treated as confidential.

Name (please print) ___________________________ Signature ___________________________

Date ___________________________
APPENDIX 2f:
Instructions for:
All Participants
INSTRUCTIONS

The task you are about to do is very simple — just make lists of items that fit into given categories. Every 30 seconds, the administrator will read out the number and the name of a category and project it on the screen at the front of the room. For each category, please do the following:

1. Write the number of the category at the top of the page.

2. Make a list of items that fit into the category. The list should contain as many relevant items as you can think of. If the first category was "Colors," your list might look something like this:

   1. red  
   2. blue  
   3. green  
   4. yellow  
   5. pink  
   6. orange  
   7. black  
   8. purple  
   9. white  
  10. brown

   If you are not sure whether an item you have thought of really belongs in your list, write it down anyway.

3. After 30 seconds, the administrator will read out the next category number and name. Write the new category number at the top of the next page, and make a new list.

4. Every so often, the administrator will ask you to go back to two or three specific lists (for example: lists #1 and #4). For each of those lists, count the number of items you wrote down, and record that number in the lower right hand corner of the page. (In the example, that would be 10, which is a relatively long list.)
APPENDIX 2g:  
Script for the Videotaped Demonstration  
All Participants

Note: In this appendix, the following notational convention has been adopted:

- anything in square brackets, [ . . . ], refers to information, instructions, etc. given only to participants in the Persuasion + Behavior groups;

- anything in brace brackets, { . . . }, refers to information, instructions, etc. given only to participants in the Persuasion groups

- any information, instructions, etc. given to both Persuasion + Behavior and Persuasion groups is indicated by both sets of brackets, [{ . . . }].
The set includes a desk or table, behind which the demonstrator sits, and a flipchart to one side. More than one camera angle will be necessary.

In the first part of the study, we presented categories in a random order. This can make it difficult, because you are constantly having to shift your mental gears. Now we want to make it easier for you. We think that if each category is linked somehow to the one before, it should be easier for you to retrieve more of the items that are stored in your memory.

You may be wondering why that would be.

As you know, all sorts of information is stored in your memory. Your semantic memory stores your general knowledge of the world, and the various facts you pick up from school, the news, talking to friends, etc. This is the kind of memory you use in making these lists. Many psychologists think that semantic memory is organized in a network of interconnected nodes. (Graphic: diagram of a network model. The camera remains on this until ***.)

According to this theory, it should be easier to remember things that have some link with what you are already thinking. For example, if you are watching a hockey game, it should be easier for you to remember hockey-related trivia than it would be to remember some obscure fact from your Calculus class, because for most people there are not too many connections between hockey and Calculus. ***

Let me explain, using several examples. [In your envelope #2, you will find paper preprinted with the category numbers and names, so that you can concentrate only on making lists and understanding the links between the categories. If you finish a list before 30 seconds is up, please do not go on to the next list. Wait for the instruction to begin.] (Change camera angle.)

We'll start with an easy category. Category 1 is: Zoo animals. (As each category is named, the demonstrator adds it to a network diagram, to illustrate the connections between categories.) Most of you should be able to think of several animals that you would find in a zoo. [You have 30 seconds to make your list. (30 seconds elapse, while the category name appears on the TV screen.)] (Change camera angle.)

Category 2 is: Endangered species. I think you can see how these categories are connected. Both have to do with animals. Your list of endangered species should be longer than if you were not already thinking about animals. We can test this by comparing the average length of your lists with the average length of lists of people had for their previous category something unrelated, like brands of soap. [Now, please make your list. (30 seconds elapse, while the category name appears on the screen.)] (Change camera angle.)

Category 3 is: Environmental problems. Again, there is a connection. Endangered species are one of the things environmentalists worry about. That should help you remember other environmental problems.

[By the way . . . We are finding that a lot of paper is being wasted in this study, since we have to have each list on a separate page and most people use only one side of the paper. If you could use
both sides of the paper, that would waste less paper and save a few trees. Whether you use one side or two makes no difference to the study, but it would be good for the environment.]}

[As usual, you have 30 seconds to write your list. (30 seconds elapse, while the category name appears on the screen.)] (Change camera angle.)

Category 4 is: Recyclable materials. The connection here is still the environment. But now we move from environmental problems to a solution. [Now, please make your list. (30 seconds elapse, while the category name appears on the screen.)] (Change camera angle.)

Category 5 is: Soft drinks. Now, this connection might not be quite so good. Soft drink cans are one of the most commonly recycled products. If you thought of aluminum cans as one of the recyclable materials in category 4, it may be easier for you to think of soft drinks. [Now, please make your list. (30 seconds elapse, while the category name appears on the screen.)] (Change camera angle.)

Category 6 is: Chocolate bars. Both soft drinks and chocolate bars are things you have between meals, and they are both junk foods, and some people have a soft drink and a bar at the same time. [Now, please make your list. (30 seconds elapse, while the category name appears on the screen.)] (Change camera angle.)

Category 7 is: Fast food restaurants. Here we are staying with the junk food theme. [Now, please make your list. (30 seconds elapse, while the category name appears on the screen.)] (Change camera angle.)

Category 8 is: Restaurants in St. John's. Now we are going off in a different direction. The junk food theme is giving way to a restaurant theme. Fast food restaurants naturally leads you to think of non-fast-food restaurants. [Now, please make your list. (30 seconds elapse, while the category name appears on the screen.)] (Change camera angle.)

Category 9 is: Canadian cities. Now, this is a bit more of a jump. The last category made you think about restaurants, but only those in St. John’s. Now you are supposed to go into city mode and think of other Canadian cities. This kind of connection is weaker, so your lists for this category may not be so long. [Now, please make your list. (30 seconds elapse, while the category name appears on the screen.)] (Change camera angle.)

Category 10 is: Major U.S. cities. Since you were thinking about Canadian cities, it should not be too difficult to think about large American cities. [Now, please make your list. (30 seconds elapse, while the category name appears on the screen.)] (Change camera angle.)

Category 11 is: U.S. states. Thinking about the cities in the U.S. should make it easier for you to think of American states. [Now, please make your list. (30 seconds elapse, while the category name appears on the screen.)] (Change camera angle.)

Category 12 is: U.S. universities. Since you are already thinking about U.S. states, and since there are state universities in every state, it should be easy to think of several U.S. universities. Of course, those aeronaut the only universities in the U.S., but it is a good start. [Now, please make your list. (30 seconds elapse, while the category name appears on the screen.)] (Change camera angle.)
Category 13 is: **Faculties and/or departments at MUN.** Since you are thinking about universities, the one you know best is probably MUN, so this should not be too difficult. [Please make your list. *(30 seconds elapse, while the category name appears on the screen.)*] (Change camera angle.)

Category 14 is: **Psychology courses.** Now, we don’t mean the course numbers; we mean the course names. This is another MUN category. Please make your list. *(30 seconds elapse, while the category name appears on the screen.)*

Category 15 is: **Professors at MUN.** The connection is, again, MUN. Since you are already thinking of MUN’s faculties and departments, and some psychology courses, just remember professors who have taught you or about whom you have heard. [Please make your list. *(30 seconds elapse, while the category name appears on the screen.)*]

So . . . the theory is that the better the connection between two categories, the easier it should be for you to retrieve items from your memory. That means that the better the connections are, the longer your lists should be. The question now is, “What is a good connection?” The next set of lists you will make will each be connected to the one before, but some of the connections will be good and some will be poor. But first, your memory needs a break, so we have a short, entertaining video for you to watch.

*** END OF VIDEO ***
APPENDIX 2h:
Questionnaire for:
All Participants

Note: The font size on the questionnaire has been reduced in order to conform to the margins specified by the Faculty of Graduate Studies. The questionnaires that participants completed were in a 12pt font.
1. In your own words, please explain what you believe this study is about.

_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

2. In YOUR OWN LIFE, how important are the following issues? (Please circle the appropriate number, where 1 means that the issue is not at all important to you, and 7 means that it is very important to you.)

Tuition fee increases at MUN:

Not at all important 1 2 3 4 5 6 7 Very important

Government cutbacks:

Not at all important 1 2 3 4 5 6 7 Very important

The cod moratorium:

Not at all important 1 2 3 4 5 6 7 Very important

The environment:

Not at all important 1 2 3 4 5 6 7 Very important
3. Understanding how your memory works is:

<table>
<thead>
<tr>
<th>Good</th>
<th>Wise</th>
<th>Harmful</th>
</tr>
</thead>
<tbody>
<tr>
<td>good</td>
<td>wise</td>
<td>harmful</td>
</tr>
<tr>
<td>extremely</td>
<td>extremely</td>
<td>extremely</td>
</tr>
<tr>
<td>quite</td>
<td>quite</td>
<td>quite</td>
</tr>
<tr>
<td>slightly</td>
<td>slightly</td>
<td>quite</td>
</tr>
<tr>
<td>neither</td>
<td>neither</td>
<td>quite</td>
</tr>
<tr>
<td>slightly</td>
<td>slightly</td>
<td>quite</td>
</tr>
<tr>
<td>good</td>
<td>wise</td>
<td>harmful</td>
</tr>
<tr>
<td>extremely</td>
<td>extremely</td>
<td>extremely</td>
</tr>
<tr>
<td>quite</td>
<td>quite</td>
<td>quite</td>
</tr>
<tr>
<td>slightly</td>
<td>slightly</td>
<td>quite</td>
</tr>
<tr>
<td>neither</td>
<td>neither</td>
<td>quite</td>
</tr>
<tr>
<td>slightly</td>
<td>slightly</td>
<td>quite</td>
</tr>
</tbody>
</table>

4. In this study, using what you know about memory is:

<table>
<thead>
<tr>
<th>Good</th>
<th>Wise</th>
<th>Harmful</th>
</tr>
</thead>
<tbody>
<tr>
<td>good</td>
<td>wise</td>
<td>harmful</td>
</tr>
<tr>
<td>extremely</td>
<td>extremely</td>
<td>extremely</td>
</tr>
<tr>
<td>quite</td>
<td>quite</td>
<td>quite</td>
</tr>
<tr>
<td>slightly</td>
<td>slightly</td>
<td>quite</td>
</tr>
<tr>
<td>neither</td>
<td>neither</td>
<td>quite</td>
</tr>
<tr>
<td>slightly</td>
<td>slightly</td>
<td>quite</td>
</tr>
<tr>
<td>good</td>
<td>wise</td>
<td>harmful</td>
</tr>
<tr>
<td>extremely</td>
<td>extremely</td>
<td>extremely</td>
</tr>
<tr>
<td>quite</td>
<td>quite</td>
<td>quite</td>
</tr>
<tr>
<td>slightly</td>
<td>slightly</td>
<td>quite</td>
</tr>
<tr>
<td>neither</td>
<td>neither</td>
<td>quite</td>
</tr>
<tr>
<td>slightly</td>
<td>slightly</td>
<td>quite</td>
</tr>
</tbody>
</table>

5. In this study, using two sides of the paper is:

<table>
<thead>
<tr>
<th>Good</th>
<th>Wise</th>
<th>Harmful</th>
</tr>
</thead>
<tbody>
<tr>
<td>good</td>
<td>wise</td>
<td>harmful</td>
</tr>
<tr>
<td>extremely</td>
<td>extremely</td>
<td>extremely</td>
</tr>
<tr>
<td>quite</td>
<td>quite</td>
<td>quite</td>
</tr>
<tr>
<td>slightly</td>
<td>slightly</td>
<td>quite</td>
</tr>
<tr>
<td>neither</td>
<td>neither</td>
<td>quite</td>
</tr>
<tr>
<td>slightly</td>
<td>slightly</td>
<td>quite</td>
</tr>
<tr>
<td>good</td>
<td>wise</td>
<td>harmful</td>
</tr>
<tr>
<td>extremely</td>
<td>extremely</td>
<td>extremely</td>
</tr>
<tr>
<td>quite</td>
<td>quite</td>
<td>quite</td>
</tr>
<tr>
<td>slightly</td>
<td>slightly</td>
<td>quite</td>
</tr>
<tr>
<td>neither</td>
<td>neither</td>
<td>quite</td>
</tr>
<tr>
<td>slightly</td>
<td>slightly</td>
<td>quite</td>
</tr>
</tbody>
</table>
6. What is your gender?
   Male ______
   Female ______

7. What is your age in years? ______

8. Would you say that you grew up in a rural setting (e.g., Hare Bay), a suburban setting (e.g., Mount Pearl), or an urban setting (e.g., Corner Brook)?
   Rural ______
   Suburban ______
   Urban ______

9. What degree are you pursuing?
   ____________________________________________

10. If you have any comments about this study, please write them below.
   ____________________________________________
   ____________________________________________
   ____________________________________________
   ____________________________________________
   ____________________________________________
   ____________________________________________
   ____________________________________________
APPENDIX 3:
CATEGORIES
APPENDIX 3a:
Premanipulation Categories Used for:
Little Premanipulation Practice Groups

1. Chocolate bars
2. Hockey teams
3. Airlines
4. Makers of sneakers/running shoes/sports shoes
5. Things associated with Australia
APPENDIX 3b:
Premanipulation Categories Used for:
Extensive Premanipulation Practice Groups

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chocolate bars</td>
<td>11</td>
<td>Wars</td>
<td>21</td>
</tr>
<tr>
<td>2</td>
<td>Hockey teams</td>
<td>12</td>
<td>Children’s cereals</td>
<td>22</td>
</tr>
<tr>
<td>3</td>
<td>Airlines</td>
<td>13</td>
<td>Languages</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Makers of sneakers, running shoes, sports shoes</td>
<td>14</td>
<td>Things associated with having the flu</td>
<td>23</td>
</tr>
<tr>
<td>5</td>
<td>Things associated with Australia</td>
<td>15</td>
<td>Daytime soap operas</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Male first names starting with ‘G’</td>
<td>16</td>
<td>Brands of shampoo</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Brands of beer</td>
<td>17</td>
<td>Deserts (i.e., hot, dry places)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Christmas carols</td>
<td>18</td>
<td>Desserts (i.e., what you eat at the end of a meal)</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Reasons to call 911</td>
<td>19</td>
<td>Things associated with chemistry</td>
<td>28</td>
</tr>
<tr>
<td>10</td>
<td>Characters on TV comedies</td>
<td>20</td>
<td>Female first names starting with ‘M’</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>
### APPENDIX 3c:
Postmanipulation Categories Used for:
All Groups

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vegetables</td>
<td>11</td>
</tr>
<tr>
<td>2</td>
<td>Fruits</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>Berries</td>
<td>13</td>
</tr>
<tr>
<td>4</td>
<td>Flavors of ice cream</td>
<td>14</td>
</tr>
<tr>
<td>5</td>
<td>Dairy products</td>
<td>15</td>
</tr>
<tr>
<td>6</td>
<td>Breakfast foods</td>
<td>16</td>
</tr>
<tr>
<td>7</td>
<td>Dinner foods</td>
<td>17</td>
</tr>
<tr>
<td>8</td>
<td>Snack foods</td>
<td>18</td>
</tr>
<tr>
<td>9</td>
<td>Cartoon characters</td>
<td>19</td>
</tr>
<tr>
<td>10</td>
<td>Disney characters</td>
<td>20</td>
</tr>
<tr>
<td>21</td>
<td>Tools you would use around the home</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Plants or flowers</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Hobbies and/or leisure activities</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Classic movies</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Movie stars</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Musicians and/or singers</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Musical instruments</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Kitchen utensils</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Furniture</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Famous buildings</td>
<td></td>
</tr>
</tbody>
</table>
REFERENCES


Mittelstaedt, Martin (1991), "All the Worry over Ecology Fails to Stem Consumption," The Globe and Mail, June 4, C1, C2.


Verville, Elinor (1988), Habit. Springfield, IL: Thomas


