

THE PRIDE LEARNING BIAS:
EVIDENCE THAT PRIDE DISPLAYS CUE KNOWLEDGE
AND GUIDE SOCIAL LEARNING

by

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Abstract

Humans learn a great deal by copying knowledgeable others, but how do individuals determine which social group members have knowledge that should be copied? I argue that the pride nonverbal expression functions to signal expertise and knowledge, and thus to bias learning such that proud others are more likely to be copied. In Study 1, I tested, and found support, for an automatic association between pride displays and knowledge. In Studies 2 and 3, I used different methods to establish the existence of a pride learning bias, which is motivated by a heightened desire for knowledge. That is, I found that pride-displaying confederates are copied significantly more frequently than those displaying other expressions, and that this occurs only when learners are financially motivated to find correct responses, suggesting that pride expressions bias social learning in a functional manner. Study 4 showed that this tendency to copy pride-displaying others transfers to other domains than the domain where pride was originally displayed, suggesting that the expertise of the individual displaying pride generalizes to other areas. In Study 5, I tested the universality of this bias by exploring whether Fijians in a small-scale traditional society demonstrated it; results were inconclusive. In Studies 6 and 7, I tested the automaticity of the bias, and found that participants do not need to be aware of having viewed pride displays in order to show preferential copying behavior (Study 6); however, these results might be due to an automatic bias to attune to positively valenced expressions, rather to pride in particular. Similarly, results were inconclusive regarding whether the pride learning bias occurs efficiently, without the need for working memory (Study 7). Finally, I performed two meta-analyses on the data collected in Studies 2A and 3-7, which supported my earlier conclusions. Together, the findings indicate that pride displays are functional for observers and play a critical role in social learning, and begin to shed light on the nature of this mechanism.

Preface

Studies 2A, 2B, and 3 were published in 2013 with Jessica Tracy (Martens & Tracy, 2013). I was the first author on this paper, responsible for designing the studies, analyzing the data, and writing the manuscript (supervised by Jessica Tracy). Studies 1, 4, and 6 were conducted with Jessica Tracy, and Study 5 was conducted with Jessica Tracy, Rita McNamara, and Joseph Henrich. All of the studies reported in this dissertation received full ethics approval from the Behavioural Research Ethics Board at the University of British Columbia: PJ in Fiji, H13-00359; Pride Situations, H07-02274; and Perceptual Judgment Task, H08-00883. I was the lead researcher on all studies described in this dissertation: I designed the studies and analyzed the data (supervised by Jessica Tracy).

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Dedication

To the woman I love more than anything, my wife, Diana.

Introduction

Humans learn a great deal by copying other social models, but given that social models can be wrong, indiscriminate copying would be maladaptive. Instead, people are thought to possess biases in *what* they learn and in *whom* they learn from; these biases are observable early in human development when considerable learning takes place. For example, in terms of *what* behaviors are copied, infants tend to copy a target's intentional behaviors and avoid copying unintentional ones (i.e., accidental behaviors; Carpenter, Akhtar, & Tomasello, 1998; Meltzoff, 1995), and children as young as 3-years old copy goal relevant behaviors (i.e., behaviors that are necessary to complete a goal) but not irrelevant ones (Bekkering, Wohlschlaeger, & Gattis, 2000; Gleissner, Meltzoff, & Bekkering, 2000; but see Horner & Whiten, 2005, for an example of high fidelity copying that includes copying of irrelevant actions, and Over & Carpenter, 2012, for a discussion of when selective copying and high fidelity copying are expected to occur). In terms of *whom* people copy, while selectively copying and learning from the "best" models—that is, those who have skill or knowledge—would certainly be the most adaptive strategy, how is it that people decide who are the best models? Evolutionary accounts of cultural learning suggest that information-acquisition biases exist to help us determine whom these desirable targets are and then guide our copying and learning behavior (e.g., Boyd & Richerson, 1985; Henrich & Gil-White, 2001). Indeed, from early childhood, humans preferentially copy some models over others (e.g., Koenig, Clément, & Harris, 2004; Birch, Vauthier, & Bloom, 2008). Here, I argue that the nonverbal pride expression—an automatic status signal that spontaneously occurs after success (Shariff & Tracy, 2009; Tracy & Matsumoto, 2008)—communicates knowledge and biases social learning such that those displaying pride are preferentially copied and learned from.

In this dissertation, I first present evidence that pride displays are associated with knowledge. Then in two studies, I present evidence that people copy those who display pride, in a process I have labeled the Pride Learning Bias (PLB), and, in an additional study, I demonstrate that copying transfers to domains outside of the area of presumed expertise of the target. An additional study tests whether the bias is likely to be a human universal by examining whether isolated villagers in Fiji demonstrate the PLB. I then report two studies that explore the cognitive underpinnings of the PLB, testing whether it functions in an automatic manner. That is, these studies test whether the PLB occurs without learners' conscious awareness of pride displays, and whether the PLB functions efficiently, requiring limited cognitive resources. Finally, I present results from two meta-analyses of the data collected in these studies. Together, this research sheds light on the question of how observers benefit from others' pride displays, and on an important mechanism underlying biased social learning.

The Cross-Cultural Pride Expression

Display and Recognition

The nonverbal pride expression consists of a head tilt, a slight smile, arms raised or akimbo, chest expanded, and the torso pushed out (Tracy & Robins, 2007a). A growing body of evidence provides strong support for the claim that the nonverbal pride expression is a human universal. Reliable recognition of pride displays by children as young as 4-years old (Tracy, Robins, & Lagattuta, 2005) suggests that either a) minimal learning is required to recognize pride, or b) recognition is universal. Other studies have demonstrated reliable pride recognition across cultures, including two highly isolated, small-scale traditional societies in Burkina Faso and Fiji (Tracy & Robins, 2008b; Tracy, Shariff, Zhao, & Henrich, 2013). Evidence of cross-cultural recognition of pride recognition in geographically and culturally separated parts of the world suggests that pride displays are not likely to be learned from others in one's culture but rather are likely to be human universals (Norenzayan & Heine, 2005).

Pride displays are not only reliably recognized, but also reliably displayed in response to pride-eliciting situations such as success. This is true for preschool children after winning a fight, high-school students who have performed well on an exam, young children after task successes, and adults from a diverse range of cultures who just won a judo match. This also includes the congenitally blind, who could not have learned to display pride through the visual modeling of others (Lewis, Allesandri, & Sullivan, 1992; Stipek, Recchia, & McClintic, 1992; Strayer & Strayer, 1976; Tracy & Matsumoto, 2008; Weisfeld & Beresford, 1982). The display of pride by such a broad range of samples, including the congenitally blind, suggests that displaying pride in response to success is a universal human tendency.

Pride and Status

Given the evidence for universality, it is possible that pride displays evolved to serve some function. Indeed, numerous studies have found that the pride expression communicates an individual's high status to others. For example, those manipulated to experience pride were subsequently rated as higher in status by participants they interacted with and by observers they did not interact with than those in a control condition (Williams & DeSteno, 2009). Furthermore, observers viewing pride displays implicitly and automatically associate these displays with high status (Shariff & Tracy, 2009; Shariff, Tracy, & Markusoff, 2012). This automatic association with high status has been found using several implicit measures, including the Implicit Association Test (IAT; Greenwald & Banaji, 1995), the single target IAT (Penke, Eichstaedt, & Asendorpf, 2006), and the Affect Misattribution Procedure (Payne, Cheng, Govorun, & Stewart, 2005). Furthermore, the association is stronger than the association between high status and another high status (i.e., dominance-related) emotion, anger, and another positively valenced emotion, happiness. These findings suggest that pride is *the* high status emotion, and that this association is not due to shared variance in positive valence, but rather something unique to pride. Moreover, this association is stronger than that between high status and an expansive posture that is not related to pride (i.e., arms extended from the body with face in a neutral expression), which suggests that this association is not simply due to increased size.

This automatic association between pride displays and high status is powerful enough to override competing contextual information. That is, when those known to be low in status (i.e., a waterboy or homeless person) display pride, they are perceived as equally high in status, or higher, than those known to be high status but not seen displaying pride (i.e., a captain of a soccer team or businessman; Shariff et al., 2012). In addition, Fijian villagers living in traditional

small-scale societies were also found to automatically associate pride displays with high status concepts (Tracy et al., 2013). The fact that this effect emerged in this sample of individuals who live in isolation from the Western world suggests that pride displays are universal status signals. Indeed, Fijians actually hold cultural norms against overt status displays such as displaying pride, which could decrease the status inferences about those who display pride because it is not considered normative. The fact that this effect still emerged despite this factor suggests that it is a cross-cultural status signal.

If the pride expression evolved to communicate high status, then displaying pride is likely to increase the fitness of those who display it. There are several reasons why we might expect this to be the case. From an evolutionary perspective, displaying an expression that reliably signals high status would have been adaptive, as research has found that those who communicate that they deserve high status tend to acquire influence over others (Cheng, Tracy, Foulsham, Kingstone, & Henrich, 2013). Influence is linked with enhanced fitness: more influential group members tend to be granted greater access to a range of valued resources (e.g., mates, food, coalitional support), and are deferred to in group decisions by lower status individuals (Cowlshaw & Dunbar, 1991; Hill, 1984). Thus, those who display pride in relevant situations (i.e., where status can be earned) are likely to reap status-related benefits.

In addition to the advantages conferred of those displaying pride, those who can reliably and automatically recognize the pride expression in others are likely to acquire certain adaptive advantages (Dimberg, 1997; Martens, Tracy, & Shariff, 2012). For example, by recognizing high status models, lower status individuals can strategically form alliances with them to gain access to valuable resources to which only high status individuals have access, such as preferred food supplies (Henrich & Gil-White, 2001). Furthermore, because those who display pride are

successful, they likely possess valuable skills or knowledge. By recognizing pride displays, observers can identify who has skills or knowledge that should be copied and selectively learn from them. This suggests that the pride expression might influence social learning.

The Pride Expression and Social Learning

Several lines of work provide preliminary support for this account of the role of pride displays in social learning. First, individuals tend to be more persuaded by arguments made by experts than by non-experts, suggesting that people are biased to learn from those who have expertise (e.g., Biswas, Biswas, & Das, 2006; Hovland, Janis, Kelley, 1953; Maddux & Rogers, 1980). People are also more likely to copy individuals who have had prior successes, compared to unsuccessful others (Morgan, Rendell, Ehn, Hoppitt, & Laland, 2011). This tendency to copy successful others seems to emerge early in development. Children as young as 3-years old are more likely to copy a social model if they identified the model as previously accurate compared to ones they identified as inaccurate (Koenig et al., 2004), and children of the same age group preferentially copy previously accurate puppets compared to inaccurate ones (Birch et al., 2008). Similarly, 4-year olds preferentially seek information from previously accurate puppets who demonstrate their knowledge independently, compared to puppets who required others' help (Einav & Robinson, 2011), and children's tendency to prefer accurate models is strong enough to override normative behavior (i.e., children will copy an unconventional action that is successful over a conventional action that is unsuccessful; Scofield, Gilpin, Pierucci, & Morgan, 2013), suggesting that the tendency to seek out successful models is particularly strong. Furthermore, in a study that manipulated the nonverbal behavior of social models, Birch and colleagues (2009) found that 2- and 3-year-old children preferred to learn from adults who were instructed to act "confident" compared to those who were instructed to act "uncertain". In this study, the confident adult's nonverbal behavior overlapped with components of the pride expression (e.g., upright posture), but it is unclear which behaviors were causally related to children's responses.

Other work consistent with the expectation that pride displays influence social learning comes from theoretical accounts of how cultural knowledge spreads from individual to individual. These accounts suggest that there are at least three types of social learning biases: skill, prestige, and success (Henrich & McElreath, 2007). Skill biases involve the preference of information from those whose skill or competence is directly observed (e.g., watching someone effectively complete a task). Pride displays might cue that a skillful behavior has just occurred, but given that pride tends to occur *after* a skilled action has already passed, it likely does not function as a skill bias. Prestige biases involve the preference of information from those who are deferred or attended to by others, and include cues such as public praise and preferential eye gaze. Although research suggests that those who show behavioral components consistent with pride displays (i.e., torso pushed out, chest expanded, head tilt up, and small smile) are likely to gain prestige in the eyes of group members (Cheng, Tracy, & Henrich, 2014), prestige biases tend to focus on how *others* cue who the prestigious models are and not on how the *model* cues his/her prestige. Instead, pride displays likely function as a success bias. Success biases involve the preference of information from those whose skill is less directly observed, using cues of success instead, such as house size or expensive jewelry. Pride displays have a strong association with success, as they are regularly displayed by children and adults cross-culturally after various types of successes (Lewis, et al., 1992; Stipek, et al., 1992; Strayer & Strayer, 1976; Tracy & Matsumoto, 2008; Weisfeld & Beresford, 1982). In this way, pride displays might cue success by nonverbally advertising who has succeeded, and consequently influence social learning. Overall, given the research reviewed above, those displaying pride are expected to be copied when social learning is desired.

The Cognitive Underpinnings of the Pride Learning Bias

If people copy those who display pride, how might this bias function? That is, do people consciously decide to copy proud models, or is the bias more automatic in nature? Because it would be beneficial to preserve resources such as energy and time that could be used elsewhere, presumably automatically interpreting emotion expressions would be most effective. If the alternative approach (i.e., conscious deliberation) were used, valuable opportunities to garner information from others might be squandered, given the ephemeral nature of emotion expressions (in extreme cases, lasting only a fraction of a second; Ekman, 2007). For these reasons, the PLB might be automatic in nature.

Research consistent with this expectation comes from several sources. First, research on person perception suggests that people are skilled at quickly, and accurately, perceiving and categorizing others. For example, when group membership is salient (e.g., gender), people quickly and automatically categorize others (see Bargh, 1999). Even when group membership is ambiguous, individuals can accurately perceive group membership from very brief exposure (e.g., 50 ms, Rule & Ambady, 2008), and these perceptions affect subsequent behavior in category-congruent ways (Rule, Macrae, & Ambady, 2009). In addition to group membership, personality traits are automatically inferred from very brief exposure. For example, trustworthiness judgments are reliably made after exposure to faces for 33 ms (Todorov, Pakrashi, & Oosterhof, 2009), and a 100 ms exposure to the faces of politicians is enough to accurately predict the results of political elections (Ballew & Todorov, 2007). These results suggest that people automatically pick up on nonverbal cues, and this affects their behavior and interpretation of others, often in ways that are congruent with these interpretations.

More specifically with regard to emotions, emotions are generally thought to work through automatic routes. For example, in the context of eliciting emotions, people have been described as "automatic appraisers" (Ekman, 2007), implicitly interpreting the situation and spontaneously displaying emotion expressions based on these interpretations, and emotion eliciting stimuli are thought to work through automatic routes (Zajonc, 1980). This research suggests that emotional displays are automatically expressed, but are they automatically perceived?

There is evidence for the automatic nature of emotion processing. For example, studies have found that subliminally flashing emotion expressions influences the spontaneous reactions of those viewing them, as measured by facial electromyographic (EMG) responses (Dimberg, Thunberg, & Elmehed, 2000), reactions to an unrelated, neutral-displaying target (Niedenthal, 1990), evaluations of unrelated words (Stenberg, Wiking, & Dahl, 1998), and drink preference and consumer behavior (Winkielman, et al., 2005). This latter study found that thirsty participants were more likely to pour, drink, pay for, and want a beverage if they were first subliminally primed with a happy image, suggesting that even brief exposures to emotion expressions influence a range of responses. Together, this research indicates that emotion displays are automatically recognized, at least on an implicit level. More explicit recognition, in the form of labeling emotion expressions, can also be automatic (Tracy & Robins, 2008a). Specifically, when judging whether the emotion expressions displayed by others in photos are a particular targeted emotion or not (e.g., "was that happiness?"), participants can accurately categorize these expressions even under cognitive load or a time constraint, suggesting that recognition—in the form of conscious labeling—is automatic and can occur with limited conscious deliberation.

Finally, dual-process models of cognition are consistent with the expectation that the PLB would be used in an automatic manner. These models suggest that the human brain uses two fundamental types of processing. For example, Petty and Cacioppo's Elaboration Likelihood Model of persuasion (ELM; 1986) suggests that people use either a central or peripheral route of information processing. The central route is more dependent on content and cognitive resources than the peripheral route, which utilizes more superficial cues (e.g., a target's perceived expertise) and requires less cognitive resources. This model specifies that in the absence of a persuasive message (e.g., "you should believe *a* because of *x*, *y*, and *z*"), people are more likely to rely on peripheral cues, such as expertise, when deciding on the veracity of claims. This suggests that when people have no other information to go on, they are likely to use peripheral cues, such as the pride display, when making decisions. This would be consistent with the expectation that the PLB is an automatic bias. Furthermore, according to this model, increasing observer distraction will increase the use of the peripheral route since it is an efficient, automatic system, which suggests that distraction should increase the tendency to copy pride-displaying individuals.

Furthermore, several different dual-process models (including ELM) have been compared, and similarities between the various models and processing types, collectively called Type I and Type II, have emerged (Evans & Stanovich, 2013). Type II processing (central route) requires working memory and tends to be more conscious and controlled than Type I processing (peripheral), which tends to be nonconscious and automatic. Both types of processing are considered adaptive, but they are better suited for different tasks. In addition to being automatic and nonconscious, this review suggested that Type I processing is associated with nonverbal processing, which tends to be independent of cognitive ability (Evans, 2008; Evans & Stanovich,

2013). These correlates suggests that the PLB fits well within the more automatic Type I processing style.

Thus, our psychology seems to be well-suited to making automatic emotion judgments with low effort. Given these findings, the advantages of automatic perceptions, and the ephemeral nature of emotion expressions, I expect pride displays to similarly be used in an automatic fashion, such that the PLB is an automatic bias.

Studies Summary

Study 1 was designed to test the hypothesis that because pride displays are associated with success and prestige (high status from possessing valuable knowledge), they are also likely to be associated with knowledge. This association would be beneficial for a social learning bias, as past research has shown that people prefer to learn from knowledgeable individuals (see *The Pride Expression and Social Learning* section above). In Study 1, I tested for this hypothesized association between pride displays and knowledge using an Implicit Association Test (IAT; Greenwald & Banaji, 1995).

I also hypothesized that when people seek knowledge (i.e., where social learning is likely to occur) they will be more likely to copy the behaviors of those who display pride than those displaying other expressions. In a series of studies, I tested whether the pride expression influences adults' copying tendencies, in situations where others' knowledge is sought, but no other information about others (including expertise) is available. It is important to exclude other information about the targets, as any additional information (e.g., expertise, past successes, etc.) might confound the findings, making it unclear whether any copying behavior was caused by the pride expression or some other factor.

To test whether people copy those who display pride, in Study 2A I showed participants a photo of a confederate displaying pride or some other expression with a caption indicating the confederate's answer to a difficult trivia question. I then gave participants the opportunity to respond to the same trivia question (correct answer to this question was incentivized; this basic procedure was used in all studies testing for the PLB), and their copying was measured. In Study 2B, I removed the financial incentive for correct responses to test whether copying was driven by a desire to seek knowledge or by some other motivation that is not linked to the desire to obtain

the answer to the trivia question (e.g., conformity). Study 3 was designed to replicate Study 2A using a more realistic, dynamic pride expression (i.e., a video of a confederate rather than a still image). In Study 4, I tested the extent to which the PLB transfers to different domains than the one in which pride was originally displayed. Specifically, Study 4 asked whether those who display pride are copied because of trait-like inferences made about the general expertise of the displayer ("this person is generally knowledgeable") or because of more state-like content specific expertise ("this person is knowledgeable in this particular domain") of the social model. Study 5 sought to replicate the PLB in a divergent cultural context in order to test whether the PLB is universal.

In addition, I hypothesized that the PLB should be an automatic bias, that a) does not require awareness of pride displays or their effects, and b) is an efficient process that does not require working memory. Study 6, a subliminal priming study, tested whether participants need to be aware of pride displays in order for them to influence their copying behavior, and Study 7, a cognitive-load study, tested whether the PLB is efficient, in that it does not require working memory in order to function

Finally, I present results from two meta-analyses of the data collected in Studies 2 through 7 in order to gain a better sense of the overall strength of the PLB. These meta-analyses also help resolve several issues from which the individual studies suffered.

Together, these studies tested whether pride displays are associated with knowledge, whether the PLB exists, is driven by a desire to seek knowledge, occurs in response to both posed and dynamic pride displays, transfers to domains other than those where the expression is displayed, generalizes across highly divergent cultures, and is automatic in the sense that it occurs without awareness and is efficient.

One important note: for consistency and simplicity I use the pronoun "I" throughout the dissertation, but all of the work presented here could not have been completed without the help of my co-authors and colleagues (see *Preface*).

Study 1

Pride Displays and Knowledge

Pride expressions are spontaneously displayed after success (e.g., Tracy & Matsumoto, 2008), including success in domains that require knowledge, such as a college exam (Weisfeld & Beresford, 1982), which suggests that pride displays might be associated with the possession of knowledge. Given that knowledgeable others tend to be copied (see *The Pride Expression and Social Learning* section above), such an association might lead to a tendency to copy those who display pride. As a first step to test this reasoning, Study 1 tested whether there is an association between pride displays and knowledge. To accomplish this, I used an IAT (Greenwald & Banaji, 1995) that paired pride displays and other expressions with knowledge or ignorance words. Faster reaction times when pride displays are paired with knowledge and other expressions with ignorance than the reverse pairing would be consistent with those displaying pride being automatically inferred to possess knowledge. I hypothesize that this will indeed be the case.

An effect along these lines would suggest that pride and knowledge are automatically and uncontrollably associated. Although this design is superficially similar to the studies of Shariff and Tracy (2009), which found that pride displays are automatically associated with high status, including prestige (i.e., high status from possessing valuable skills or knowledge; Henrich & Gil-White, 2001), this study is distinct in that it is testing for an association specifically between pride and knowledge, rather than between pride and status.

Method

Participants and Procedure. In exchange for course credit, undergraduates were asked to complete a sorting task, which was a modified version of the Implicit Association Test (IAT; Greenwald & Banaji, 1995) where participants viewed photos of pride-displaying or other

expression-displaying confederates (Study 1A: shame; Study 1B: neutral; Study 1C: happy), which were paired with words that represent 'knowledge' or 'ignorance' concepts (see *Stimuli* section below). Faster responses on expected trials (i.e., where pride is paired with knowledge and other expressions with ignorance) than on unexpected trials (i.e., when pride is paired with ignorance and other expressions with knowledge) would indicate a stronger implicit association between expected than unexpected pairs. Twenty-seven (74% female), 33 (70% female), and 22 (82% female) participants took part in Studies 1A, 1B, and 1C, respectively. Although the sample sizes might seem small, previous work using similar IAT methodology comparing pride displays and other expressions with high and low status words used comparable sample sizes, suggesting that these samples provide adequate power if the association between pride and knowledge concepts is as strong as that between pride and status concepts (five studies had $Ns = 20$; Shariff & Tracy, 2009).

Stimuli. Pride, shame, neutral, and happy images were taken from the previously validated UC Davis Set of Emotion Expressions (UCDSEE; Tracy, Robins, & Schriber, 2009) and screenshot images of emotion videos that have been previously validated. These comparisons were included to test whether pride displays are associated with knowledge concepts to a greater extent than displays that signal low status (shame), displays that are irrelevant to status and convey no emotion (neutral), and displays that share variance with pride in positive valence (happiness). The 'knowledge' words included *capable*, *expert*, *ingenious*, *intelligent*, *skilled*, *smart*, *talented*, and *wise*. The 'ignorance' words include *dumb*, *foolish*, *incapable*, *inept*, *stupid*, *unintelligent*, *unskilled*, and *untalented*. Although valence is likely confounded in these stimuli, Study 1C directly addresses this issue by using a positive valenced emotion (i.e., happiness) as a comparison. Details on selection criteria and the stimuli validation

are presented below. Importantly, none of the words used in this study were previously used by Shariff and Tracy (2009) when they tested for an association between pride and status, nor would any of Shariff and Tracy's words qualify for this study. The closest stimulus word used by Shariff and Tracy was *prestige*, which might be associated with *knowledge*, yet colloquially *prestige* can be used as *celebrity* (Tehrani, 2013). This association with *celebrity* would have been relevant to Shariff and Tracy's studies that were concerned with status, but it is not relevant for testing pride's hypothesized association with knowledge.

Validation of Knowledge and Ignorance Words. Knowledge and ignorance words were selected from an online thesaurus (thesaurus.com) using the keywords "knowledge" and "ignorance" to find synonyms and antonyms. Words that emerged as synonyms or antonyms were included in the list and were also used as keywords to find additional synonyms and antonyms. This process was repeated until the stimuli list consisted of 19 different words.

Following the creation of this list of words, 13 undergraduate judges rated the 19 different words on two different dimensions (knowledge and ignorance) using a 5-point scale from "1 - I would definitely call this knowledge [ignorance]" to "5 - I would definitely not call this knowledge [ignorance]". Inter-rater reliability was high, $\alpha = .99$ and $.93$, for knowledge and ignorance, respectively. See Table 1 for the means and standard deviations of knowledge and ignorance ratings for each word.

Table 1

Means and Standard Deviations of Knowledge and Ignorance Ratings for Word Stimuli

Stimuli	<u>Knowledge</u>		<u>Ignorance</u>	
	Mean	Standard deviation	Mean	Standard deviation
*Capable	3.85	.90	1.62	.96
Collected	2.38	1.04	1.62	.96
Concerned	1.77	.72	2.00	1.15
**Dumb	1.08	.28	4.08	1.26
*Expert	4.85	.38	1.38	.87
**Foolish	1.15	.38	4.23	1.01
Impartial	2.23	1.17	2.23	1.36
**Incapable	1.23	.44	3.54	1.45
**Inept	1.31	.48	3.46	1.33
*Ingenious	4.15	.99	1.85	1.21
*Intelligent	4.69	.48	1.46	.88
*Skilled	4.62	.51	1.69	1.18
*Smart	4.67	.49	1.38	.87
**Stupid	1.15	.38	4.15	1.46
*Talented	3.92	1.19	1.54	.97
**Unintelligent	1.15	.38	4.15	1.14
**Unskilled	1.15	.38	3.08	1.66
**Untalented	1.31	.63	3.00	1.58
*Wise	4.85	.38	1.08	.28

Note: * indicates knowledge words selected as stimuli for the main study, while ** indicates ignorance words selected as stimuli for the main study.

The highest scoring words on knowledge were selected as stimuli (i.e., *capable, expert, intelligent, ingenious, skilled, smart, talented, and wise*) and had an acceptable inter-item reliability, $\alpha = .71$. The means of all these items on knowledge were high (greater than or equal to 3.85), and the means of these items on ignorance were low (less than or equal to 1.69). The highest scoring ignorance words (i.e., *dumb, foolish, incapable, inept, stupid, unintelligent, unskilled, and untalented*) were also selected as stimuli, and had a high inter-item reliability, $\alpha = .88$. The means of all these items on ignorance were greater than or equal to 3.00, and less than or equal to 1.31 on knowledge.

Results and Discussion

Implicit associations were calculated using the scoring procedure proposed by Greenwald, Nosek, and Banaji (2003). First, trials where participants were likely not paying attention, operationalized as those in which responses occurred after 10 seconds, were removed. In addition, for each incorrect response a 15 ms penalty was added to the mean trial time. Next, difference scores were calculated by subtracting the mean of the two expected pairings from the mean of the two unexpected pairings. These difference scores, or *d* scores, were then compared to zero using one-sample *t*-tests. *d* scores not significantly different from zero suggest that there is no significant difference between reaction times when pride displays are paired with knowledge words and other expressions with ignorance words than the reverse pairing, while *d*

scores greater than zero represent a stronger association between pride displays and knowledge words and other expressions and ignorance words than the reverse pairings.

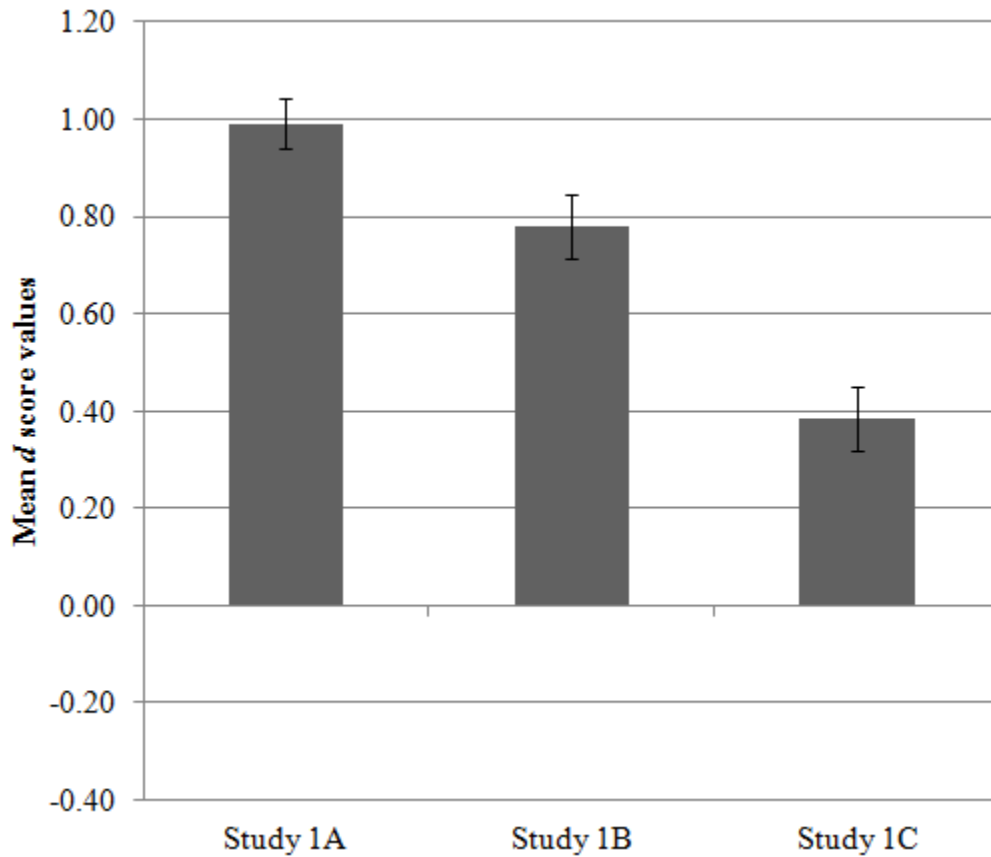
Study 1A. As expected, reaction times were significantly faster when pride expressions were paired with knowledge words and shame expressions with ignorance words than the reverse pairings, mean d score = .99, $t(26) = 18.27$, Cohen's $d = 7.17$, $p < .000$ (note: the d score value is the metric commonly used in IAT studies, whereas Cohen's d is a standardized effect size measure, which is provided to give a sense of the size of the association in a more familiar format; Figure 1 displays d scores, not Cohen's d). This finding suggests that pride expressions are more strongly associated with knowledge, and shame expressions with ignorance, than the reverse. However, it is unclear whether these results are due to pride's theorized association with knowledge or shame's potential association with ignorance. Shame is a low status emotion that results from failure in a valued domain (e.g., Tracy & Matsumoto, 2008), which might lead it to be associated with ignorance. Study 1B addressed this issue by comparing pride expressions with neutral expressions.

Study 1B. As expected, reaction times were significantly faster when pride expressions were paired with knowledge words and neutral expressions with ignorance words than the reverse pairings, mean d score = .78, $t(32) = 13.18$, Cohen's $d = 4.66$, $p = .000$ (see Figure 1). This finding suggests that pride expressions are more strongly associated with knowledge, and neutral expressions with ignorance, than the reverse pairings. Since there is no theoretical reason to expect that a neutral expression would be associated with ignorance, when taken in tandem with Study 1A, this finding suggests that pride is more strongly associated with knowledge than with ignorance. However, the effects of Study 1A and 1B might be driven by positive valence

associated with pride expressions. Study 1C addressed this issue by comparing pride expressions with another positively valenced emotion display, happy expressions.

Study 1C. As expected, reaction times were significantly faster when pride expressions were paired with knowledge words and happy expressions with ignorance words than the reverse pairings, mean d score = .38, $t(21) = 4.23$, Cohen's $d = 1.85$, $p = .000$ (see Figure 1). This finding suggests that pride expressions are more strongly associated with knowledge, and happy with ignorance, than the reverse pairings.

Figure 1. Mean d score values for the IATs in Studies 1A, 1B, and 1C.



Note. Positive d score values represent a stronger association between pride displays with knowledge words and other expressions (i.e., shame, neutral, & happy in Studies 1A, 1B, and 1C, respectively) with ignorance words than the reverse pairings. These are d score values, not Cohen's d . Differences from 0 were significant, $ps < .05$. Error bars represent standard error.

Studies 1A, 1B, and 1C suggest that pride displays are strongly associated with knowledge, and this effect is not due to positive valence. Effect sizes in all three studies were quite large (Cohen's ds ranged from 1.85 to 7.17), suggesting that this is a powerful effect. Indeed, some of these effect sizes are considerably larger than those previously found between pride displays and high status (Cohen's ds ranged from 1.93 to 2.55; Shariff & Tracy, 2009).

Although it might be tempting to conclude that pride displays have a stronger association with knowledge than they do with high status, conclusions like this one are premature given that stimuli differences between the studies might have affected results. However, pride displays do seem to have a strong and unique association with knowledge.

Thus, Study 1 adds to our understanding of how pride displays are interpreted. The results are the first to demonstrate that knowledge perceptions result from pride displays, and that this association is automatic in that it cannot be controlled. One implication of this association is that in everyday situations, people cannot help but think that those who display pride are knowledgeable. This acquired information, of how knowledgeable other social group members are, is likely to play an important part in subsequent learning behavior. That is, those who possess knowledge are likely to be good models to learn from and copy. In Study 2, I tested whether those who display pride are copied to a greater extent than those who display other expressions when their motivation for accurate knowledge is heightened.

Study 2A

To test whether people copy the behaviors of those who display pride, in Study 2A participants were asked to answer a difficult trivia question after viewing someone else answer the same question. The trivia question was designed to be difficult, to ensure that participants did not know the correct response, and thus decrease the likelihood that participants would use their prior knowledge rather than seek out social learning. It was predicted that participants would selectively copy the answers of those displaying pride.

Method

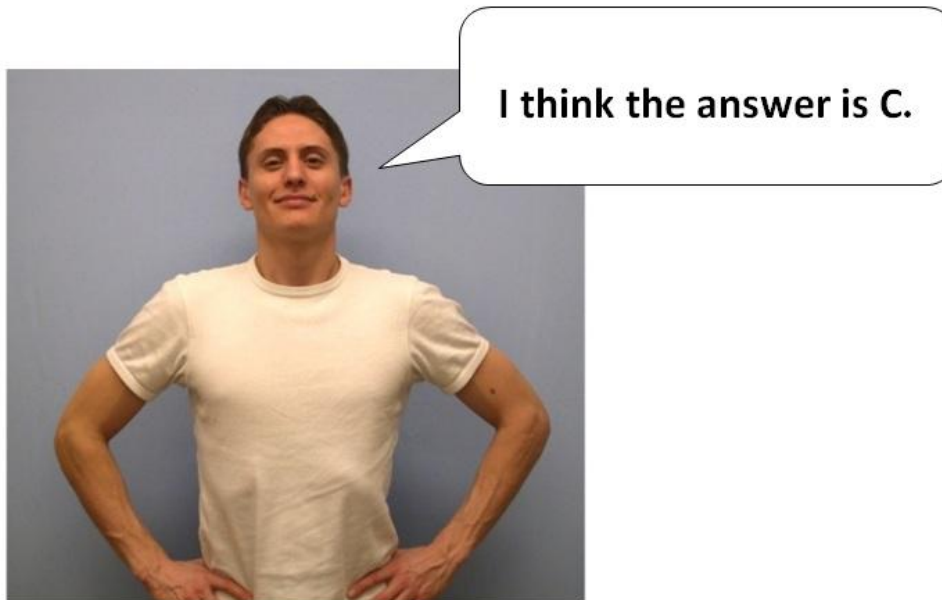
Participants and Procedure. 423 undergraduates (63% female) were approached individually on a large university campus, and asked to answer a trivia question while viewing a photo of another person doing the same. They were told to imagine that the other person was another participant. To motivate participants to seek correct answers, they were told that correct responses would earn entries into a \$50 draw. Previous research has shown that providing incentives for accurate responses increases participants' efforts to seek out correct answers (e.g., Baron, Vancello, & Brunzman, 1996). This is particularly important in the context of completing a psychology study such as this one, where participants were approached unsolicited, and other motivations might be heightened and adversely affect results (e.g., a desire to finish the study in a speedy manner might override any desire for accuracy). By heightening participants' motivation to be accurate, I am putting this motivation at the forefront.

Stimuli. Participants viewed a photo of a Caucasian male or female target (gender was varied randomly; no participant- or target-gender effects emerged), taken from the UCDSEE (Tracy et al., 2009). Participants were randomly assigned to view a target displaying pride ($n=104$), shame ($n=107$), happiness ($n=104$), or neutral ($n=108$). These comparisons were

included to test whether pride displays promote greater copying than displays that signal low status (shame), are irrelevant to status and convey no emotion (neutral), and share variance with pride in positive valence (happiness). These conditions are used throughout the dissertation for the same reasons discussed here, so for brevity, the justification for these conditions will no longer be mentioned.

Participants viewed the photo printed on an 8 x 11" piece of paper. Directly below the photo was a trivia question, varied between participants (no effect of question emerged): "What is the smallest bird in the world?," with response options: "A. *Patagona gigas*, B. *Mellisuga helenae*, C. *Serinus canaria*, D. *Melopstittacus undulatus*, or E. *Agapornis*" (correct answer B); or "Which number is the closest to the actual value of Pi, π ?", with response options: "A. 3.141592652, B. 3.141592635, C. 3.141592654, D. 3.141592665, or E. 3.141592721" (correct answer C). For the first question, photographed targets indicated (via a caption) that their response was C; for the second question, targets responded B (see Figure 2 for an example). By having targets always answer incorrectly, it was ensured that any copying that occurred would be driven entirely by emotion displays and not by participants' prior knowledge about the correct answer.

Figure 2. An example of the pride-condition stimuli used in Study 2A.



1. What is the smallest bird in the world?

- A) *Patagona gigas*
- B) *Mellisuga helenae*
- C) *Serinus canaria*
- D) *Melopstittacus undulatus*
- E) *Agapornis*

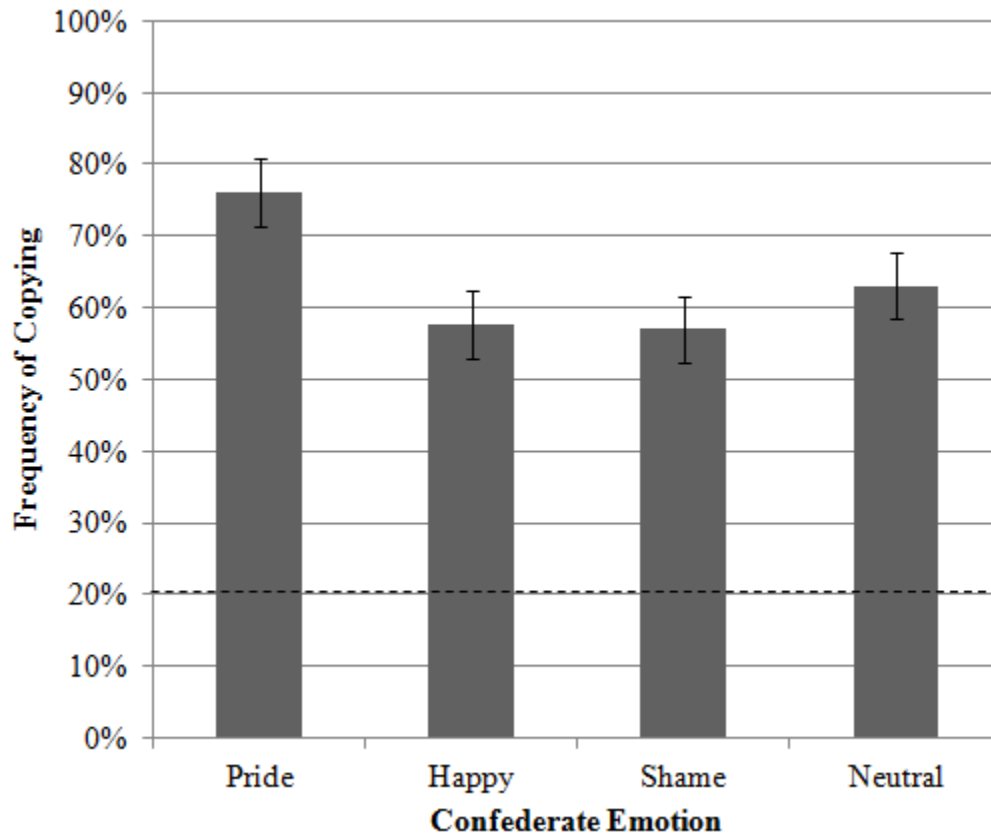
Please write your response in the space provided _____

Results and Discussion

To determine whether the emotion-expression manipulation affected the frequency of copying, I ran a one-way analysis of variance (ANOVA) of emotion-expression on copying frequency, which was significant, $F(3, 419) = 3.53, p = .02, \chi^2(3) = 10.42, p = .02$, such that pride-displaying targets were copied most frequently, significantly more than neutral, $t(210) = 2.06, \text{Cohen's } d = .28, p = .04, \chi^2(1) = 4.21, p = .04$; happy, $t(206) = 2.84, \text{Cohen's } d = .40, p = .01, \chi^2(1) = 7.83, p = .01$; and shame-displaying targets, $t(209) = 2.96, \text{Cohen's } d = .41, p = .003, \chi^2(1) = 8.49, p = .004$ (copying $M_s = 76\%, 63\%, 58\%$ and 57% for pride, neutral, happy, and shame conditions, respectively; see Figure 3). Of note, I conducted both t -tests and χ^2 tests to

compare copying frequencies between conditions, given the non-parametric dependent variable. Both are reported, and in all cases results held across both tests. In the rest of the dissertation, I continue to report both of these tests for copying data, so for the sake of brevity, the justification for these tests will not be mentioned for each study. None of the other frequencies differed significantly from each other. Based on binomial tests, in all conditions targets were copied significantly more frequently than chance (set at 20% based on the number of response options), $ps < .000$, $.000$, $.000$, and $.000$ for pride, neutral, happy, shame, respectively. Thus, consistent with predictions, participants were more likely to copy the target's response than guess randomly, regardless of emotion, but they showed a bias toward copying targets who displayed pride.

Figure 3. Effect of others' emotion displays on the tendency to copy their responses to a difficult trivia question when incentivized, Study 2A.



Note. Differences between pride and all other emotion conditions were significant, $ps < .05$; no other significant differences emerged. The dotted line represents chance responding (20%); that is, the proportion of participants who would demonstrate copying if they were responding randomly. Error bars represent standard error.

These results suggest that when individuals are in a heightened motivation to attain knowledge, they tend to preferentially use the knowledge displayed by social group members who show pride, more so than those who display other emotions or no emotion. This is the first direct evidence for the PLB. However, it is possible that the copying behaviors found here were

due to participants seeking to conform to a social norm or to an individual displaying an expression that conveys dominance or power over others, rather than seeking to acquire valuable knowledge. If this is the case, then participants might not be internalizing the knowledge they acquired, but rather behaving in a certain way to "fit in" or out of fear. In other words, because pride displays automatically communicate both prestige (i.e., knowledge, respect) and dominance (power based on threat and intimidation; Shariff & Tracy, 2009), observers might have copied pride-displaying targets out of a desire to conform to normative standards or to a powerful and intimidating individual, rather than out of a desire to learn from a knowledgeable group member.

However, past research challenges this alternative explanation. Theories about how humans learn information from each other suggest that incentives for accuracy decrease the likelihood of copying for normative concerns (Henrich & Henrich, 2007). More specifically, when task difficulty is low (i.e., an easy task), incentives decrease copying as people rely on their own knowledge to complete the task, but when task difficulty is high (i.e., a hard task), incentives increase copying as people rely on the knowledge of others. Indeed, research has been consistent with this theorizing. For example, Baron, Vandello, and Brunzman (1996) varied task difficulty and incentive level for accuracy and measured participants' copying behavior. They had participants first view a perpetrator of a crime for 5 seconds, in the easy condition, or for half a second, in the difficult condition, and they later asked participants to pick the perpetrator from a lineup of four suspects. Participants made their selection after first hearing several confederates make their unanimous (incorrect) selection. When the motivation for accuracy was low (i.e., they completed the task for "the good of science"), task difficulty made little difference, and participants conformed to the confederates' judgment roughly equally regardless of how difficult

the task was. However, when motivation for accuracy was heightened (i.e., they completed the task both for "the good of science" and because correctly identifying a perpetrator would earn them entry into a draw for \$20), copying increased when the task was difficult and decreased when the task was easy. These findings suggest that copying in Study 2A was likely driven by informational concerns rather than normative concerns, since participants were incentivized for accuracy and the task was difficult (i.e., the trivia question was difficult and unlikely to be known by participants).

However, to test whether this was indeed the case, I conducted Study 2B, which was a direct replication of Study 2A in every way except that participants were *not* provided with an incentive for correct responses. If non-incentivized participants in Study 2B demonstrate a pride-copying bias comparable to incentivized participants of Study 2A, it would suggest that the effects were due to a desire to conform to the pride-displaying target, and not to a heightened knowledge-seeking motivation—that is, that participants copied the pride displaying target for normative reasons, rather than informational reasons.

Study 2B

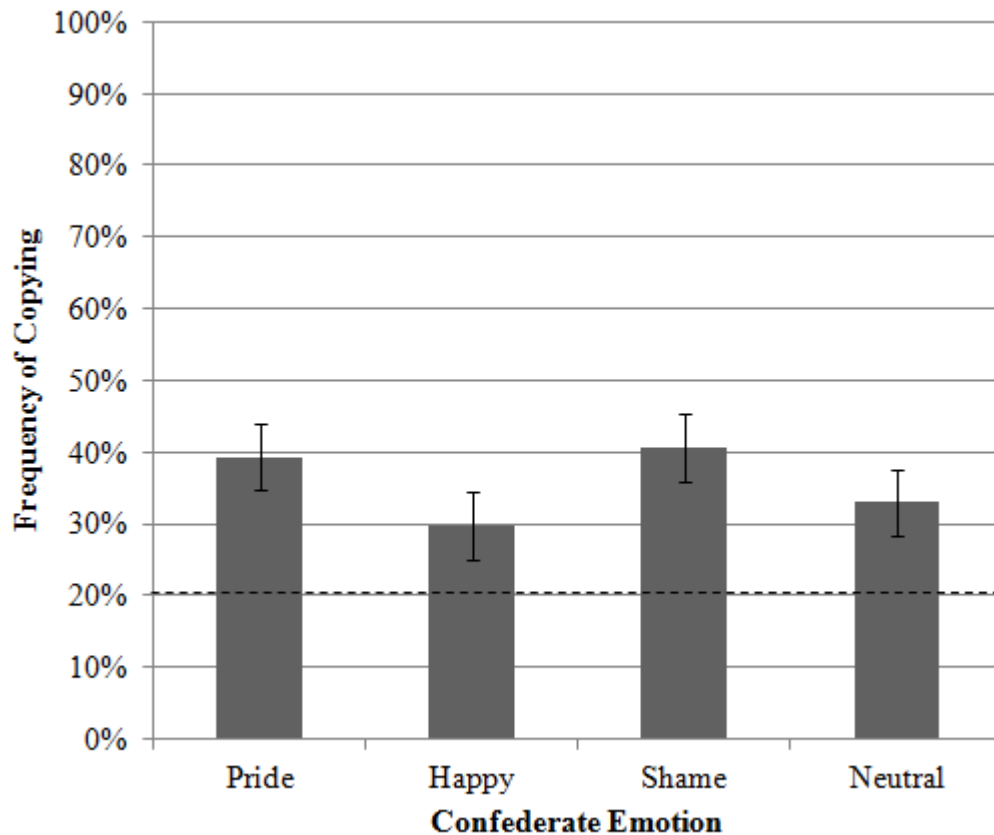
Method

418 undergraduates (71% female) were recruited from the same population as Study 2A and followed the same procedures, except that they were not offered a financial reward for correct responses.

Results and Discussion

As in Study 2A, to test whether the emotion manipulation influenced copying frequency, on a one-way ANOVA of emotion-expression on copying frequency was run, which was not significant, $F(3, 414) = 1.18, p = .32, \chi^2(3) = 3.55, p = .31$. Indeed, as can be seen from Figure 4, there was little difference in copying rates between the expression conditions (copy Ms = 39%, 30%, 41%, and 33% for pride, happy, shame, and neutral conditions, respectively), and, overall, participants were substantially less likely to copy targets regardless of the expression they showed ($M = 36%$) compared to in Study 1A (overall $M = 63%$), $t(839) = 8.35$, Cohen's $d = .57$, $p < .000, \chi^2(1) = 64.58, p < .000$ (although, even here, participants in all conditions tended to copy targets significantly more frequently than chance, based on binomial tests, $ps = .000, .01, .000$, and $.001$ for pride, happy, shame, and neutral, respectively). Most important, there was also a significant difference between studies in copying rates within the pride-expression condition, $t(209) = 5.78$, Cohen's $d = .80, p < .000, \chi^2(1) = 29.06, p < .000$, with only 39% of participants copying pride-displayers when they were not incentivized, compared to 76% when they were, in Study 2A.

Figure 4. Effect of others' emotion displays on the tendency to copy their responses to a difficult trivia question when not incentivized, Study 2B.



Note. The dotted line represents chance responding (20%); that is, the proportion of participants who would demonstrate copying if they were responding randomly. Error bars represent standard error.

Thus, although I cannot draw any strong conclusions from the absence of a significant effect of emotion expression on copying in Study 2B, when viewed in tandem with the results of Study 2A (which had equal power to test the same hypothesis), these results indicate an important boundary condition on the PLB. Specifically, this bias seems to occur only when participants are in a heightened state to attain knowledge, suggesting that the tendency to copy

those who display pride is driven by social learning motives—a desire to seek correct information—and not by other conformity motives, such as a desire to behave in a way that is consistent with a social norm or with a more powerful group member.

However, the artificiality of Studies 2A and 2B (in both, participants were told to imagine that a photographed person was another participant) is a limitation of both these studies. Furthermore, though the use of still photos allowed me to completely control emotion expressions, it may have further reduced ecological validity, as in everyday social interactions expressions tend to unfold dynamically over time, and are accompanied by corresponding movements and vocal tone. Study 3 addressed these issues by exposing participants to videos of confederates dynamically displaying emotion expressions while responding to trivia questions. Once again, I hypothesized that those displaying pride would be copied to a greater extent than those displaying other expressions.

Study 3

Method

Participants and Procedure. 199 undergraduates (76% female) were approached individually on a large university campus, in a study that, they were told, would examine people's judgments while distracted. Thus, they were asked to complete two tasks simultaneously: (a) watch a video of a participant from a different study (actually a confederate) answering a trivia question, in order to make subsequent judgments about him/her, and (b) answer the same trivia question immediately after watching the video. Given the results of Study 2B, participants were incentivized to answer correctly; they were told that correct responses would earn an entry into a \$50 draw. Participants then watched the video, responded to the trivia question, then finally completed a questionnaire.

Participants were required to answer the trivia question within 2 seconds of videos ending (i.e., immediately after confederates responded to the question), to prevent conscious deliberation that might override any emotion-based bias, given prior research suggesting that pride displays implicitly communicate status and knowledge (see Study 1; Shariff & Tracy, 2009; Shariff et al., 2012). Although this increased the artificiality of the study, it ensured that conscious deliberation had a minimal effect. Participants were again randomly assigned to a pride, shame, neutral, or happiness condition, which determined the expression shown by confederates in the videos.

In addition, after the study, participants were probed for prior knowledge and suspicion, which determined whether they were included in analyses. These knowledge and suspicion probes were not included in Studies 2A and 2B because in these studies participants were explicitly told to "imagine" that the target was another participant. Conversely, the cover story of

Study 3 required deception (i.e., the person in the video is another participant) which needed to be believed in order for the study to work. Consequently, participants' level of suspicion is of greater concern in Study 3. Because suspicion and prior knowledge might affect copying rates, these probes were included in this follow-up study. All participants who reported recognizing the confederate ($n = 8$) were removed, given that their prior knowledge of the confederate could have influenced their behavior. In addition, those reporting knowing the answer to the trivia question ($n = 15$) were removed since social learning was unlikely to have occurred. Next, because the manipulation relied on deception (i.e., participants needed to believe that confederates were in fact other participants), and any level of suspicion could influence responses (Ferguson & Bargh, 2004), I used a funnel debriefing method to remove participants who demonstrated any level of suspicion (Bargh & Chartrand, 2000). Specifically, participants were first asked if they “noticed anything suspicious about the study,” and were removed if they responded in the affirmative ($n = 58$). Next they were asked if they noticed anything suspicious about “the experimenter”; an additional 9 participants responded yes and were removed. Third, they were asked if they noticed “anything suspicious about the task”; 13 participants did and were removed at this stage. Finally, they were asked if they noticed anything suspicious about “the other participant in the video”; 27 additional participants were removed. Although this resulted in a large number of exclusions due to suspicion, the fact that many of these individuals were appropriately suspicious (e.g., of the “other participant in the video”) in ways that would affect results, but only revealed this to be the case after thorough probing, demonstrates the importance of using a funnel debriefing method. After these exclusions, I retained a final sample of $N = 69$ (78% female; $n_s = 15, 18, 19, 17$ for pride, happy, neutral, and shame conditions); the

proportion of participants removed due to suspicion did not significantly differ between conditions, $\chi^2(3) = .70, p = .87$. For results for the entire sample, please see Appendix A.

Stimuli. Participants viewed a video of a same-sex confederate (no gender effects emerged) answering, aloud, a trivia question that was read by an off-screen experimenter (see <http://ubc-emotionlab.ca/pridelearningbias> for videos). Both confederates were Caucasians in their early twenties. The trivia question was: "Which of the rivers below is the longest?" followed by response options: "A. Mackenzie, B. Lena, C. Niger, D. Ob, or E. Congo" (correct answer D). Confederates answered C. Throughout the videos, pride-displaying confederates expanded their chests, held their heads up slightly, smiled slightly, held one or both arms akimbo, and stood up straight (Tracy et al., 2009). Shame-displaying confederates slumped their shoulders, lowered their heads, did not smile, and kept hands at their sides (Keltner, 1995; Tracy, et al. 2009). Neutral-displaying confederates stood in a relaxed posture without raising or lowering their heads or smiling. Happy-displaying confederates smiled and generally behaved "happily" by acting energetic and using having a positive tone when they spoke. The videos were verified by a trained Facial Action Coding System (FACS; Ekman & Friesen, 1978) researcher that all expressions correctly conveyed intended emotions.

Measures.

Copying behavior. Copying was assessed on the basis of whether participants selected the same answer to the trivia question as confederates.

Manipulation check. Participants rated the extent to which confederates displayed pride (assessed with the 14-item Authentic and Hubristic Pride scales; Tracy & Robins, 2007b; α s = .77 and .87, respectively), "happy" and "shameful".

Results and Discussion

Manipulation Check. Pride-displaying confederates were judged as showing significantly greater authentic pride than happy-displaying confederates, $t(31) = 2.98$, Cohen's $d = 1.07$, $p = .01$, shame-display confederates, $t(32) = 13.31$, Cohen's $d = 4.71$, $p = .000$, and neutral-displaying confederates, $t(30) = 4.21$, Cohen's $d = 1.54$, $p = .000$ (see Table 2 for the means and standard deviations of emotion ratings by emotion condition). A similar pattern emerged for hubristic pride, with significantly greater hubristic pride ratings for pride-displaying confederates than happy-displaying confederates, $t(31) = 7.30$, Cohen's $d = 2.62$, $p = .000$, shame-displaying confederates, $t(32) = 11.41$, Cohen's $d = 4.03$, $p = .000$, and neutral-displaying confederates, $t(30) = 5.33$, Cohen's $d = 1.95$, $p = .000$. Similarly, shame-displaying confederates were judged to show significantly more shame than happy-displaying confederates, $t(35) = 4.35$, Cohen's $d = 1.47$, $p = .000$, proud-displaying confederates, $t(32) = 2.50$, Cohen's $d = .88$, $p = .02$, and neutral-displaying confederates, $t(34) = 3.40$, Cohen's $d = 1.17$, $p = .002$; and happy-displaying confederates were judged to show significantly more happiness than shame-displaying confederates $t(35) = 11.91$, Cohen's $d = 4.03$, $p = .000$, and neutral-displaying confederates, $t(33) = 4.42$, Cohen's $d = 1.54$, $p = .000$. Pride-displaying confederates did not differ significantly from happy-displaying confederates in perceived happiness, $t(31) = 1.08$, Cohen's $d = .39$, $p = .29$, likely due to the presence of a smile in the pride expression. Importantly, this confusion should work against hypotheses by reducing the magnitude of any difference between the pride and happy conditions.

Table 2

Means and Standard Deviations of Emotion Ratings by Emotion Condition

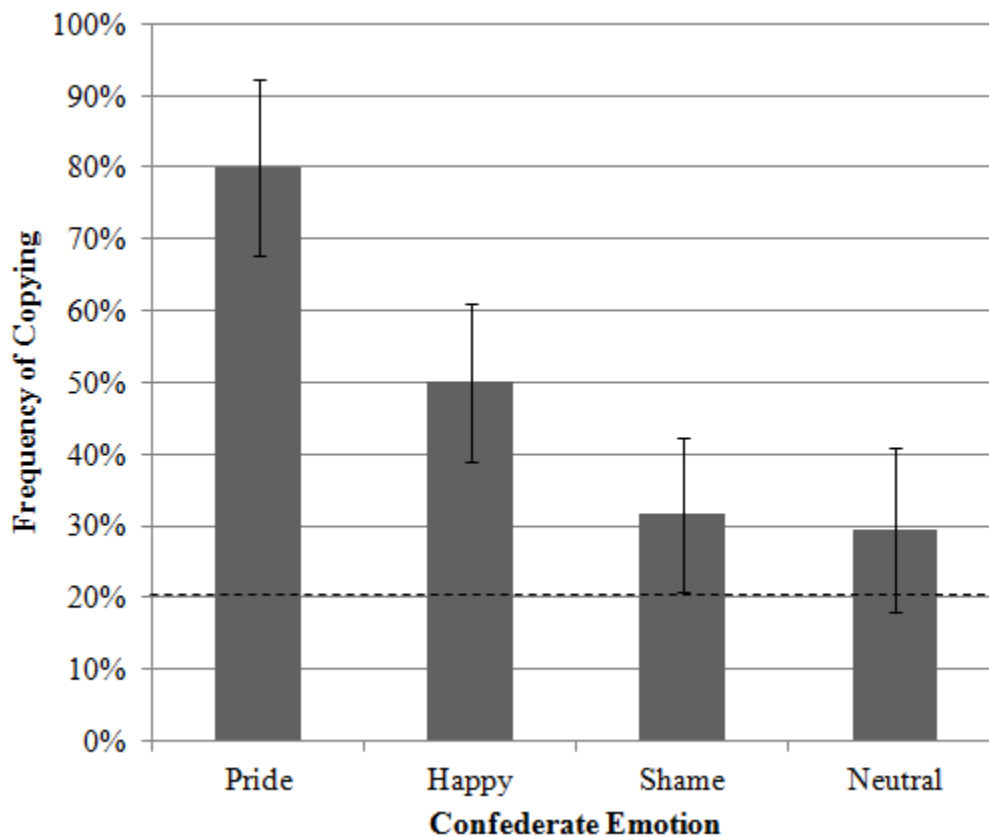
Emotion Condition	<u>Authentic pride</u>		<u>Hubristic pride</u>		<u>Happy</u>		<u>Shame</u>	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Pride	5.72	1.18	4.73	1.37	4.93	1.58	1.60	1.45
Happy	4.32	1.48	1.69	1.02	5.50	1.42	1.06	.24
Shame	1.75	.50	1.11	.20	1.37	.50	3.16	2.03
Neutral	3.83	1.18	2.11	1.40	3.47	1.28	1.41	.62

Does the Pride Expression Promote Copying? I again conducted a one-way ANOVA to test the effect of emotion expression on copying behavior. Emotion expression significantly affected copying frequency, $F(3, 65) = 3.91, p = .01, \chi^2(3) = 10.55, p = .01$, such that pride-displaying confederates were copied most frequently, marginally more than happy, $t(31) = 1.82, p = .08$, Cohen's $d = .65, \chi^2(1) = 3.18, p = .07$; significantly more than neutral, $t(30) = 3.21$, Cohen's $d = 1.17, p = .003, \chi^2(1) = 8.19, p = .004$; and significantly more than shame-displaying confederates, $t(32) = 3.12$, Cohen's $d = 1.10, p = .004, \chi^2(1) = 7.89, p = .01$ (mean copying frequency for pride, happy, neutral, and shame conditions were 80%, 50%, 29%, 32%, respectively; see Figure 5). None of the other frequencies differed significantly from each other. Based on binomial tests, only pride- and happy-displaying confederates were copied significantly more frequently than would be expected by chance (20%), $ps = .000$ and $.004$, respectively ($ps = .24$ and $.16$ for neutral and shame conditions, respectively). These results are consistent with the findings of Study 2A in that those displaying pride are copied more than those displaying other

expressions, but one important difference between studies is that happy displays also seem to be copied here. The findings do, however, converge with Study 2A in suggesting that individuals are biased to copy those who display pride when motivated toward social learning.

Subsidiary Analyses. In the previous analyses, those reporting knowing the answer to the trivia question were removed because they are not likely to rely on social learning. However, those who reported knowing the answer to the trivia question but answered it *incorrectly* might still rely on social learning. That is, they actually did not know the correct answer, as indicated by their incorrect response, so they might still unknowingly rely on the knowledge of others. Consequently, I ran the analyses again with this new exclusion criteria (and suspicious participants removed using the same criteria as above; $N = 76$, which included an additional 7 additional participants, $n_s = 15, 19, 22$, and 20 in pride, happy, shame, and neutral conditions, respectively). Similar results emerged with this sample. Emotion expression significantly affected copying frequency, $F(3, 72) = 2.80, p = .046, \chi^2(3) = 7.93, p = .047$, such that pride-displaying confederates were copied most frequently, marginally more than happy, $t(32) = 2.00, p = .05$, Cohen's $d = .71, \chi^2(1) = 3.78, p = .05$; significantly more than neutral, $t(33) = 2.87$, Cohen's $d = 1.00, p = .01, \chi^2(1) = 6.99, p = .01$; and significantly more than shame-displaying confederates, $t(35) = 2.49$, Cohen's $d = .84, p = .02, \chi^2(1) = 5.55, p = .02$ (mean copying frequency for pride, happy, neutral, and shame conditions were 80%, 47%, 35%, 41%, respectively). None of the other frequencies differed significantly from each other. Based on binomial tests, pride-, happy-, and shame-displaying confederates were copied significantly more frequently than would be expected by chance (20%), $p_s = .000, .002$, and $.02$, respectively, and neutral was marginal, $p = .09$. Thus, similar conclusions are drawn from this subsidiary analysis; those who display pride are copied most frequently.

Figure 5. Effect of others' dynamic emotion displays on the tendency to copy their responses to a difficult trivia question when incentivized.



Note. Differences between pride and all other emotion conditions were significant, $ps < .05$ (one-tailed for the difference between pride and happy); no other significant differences emerged. The dotted line represents chance responding (20%); that is, the proportion of participants who would demonstrate copying if they were responding randomly. Error bars represent standard error.

Studies 2A and 3 converge on the finding that pride displays bias social learning, such that pride-displaying individuals are copied by individuals who are experiencing a heightened motivation to seek knowledge. In Study 3, happy-displaying targets were also copied more frequently than neutral- and shame-displaying targets (though marginally less than pride-

displaying targets), suggesting that happy displays might also bias social learning. Indeed, people might benefit by copying happy individuals, as those who rate themselves as happy are found to live longer (Diener & Chan, 2011), and smile intensity in photographs predicts longevity (Abel & Kruger, 2010). These findings might suggest that those who display happy expressions should be copied because of their increased longevity. That is, happy social models might be copied by others so that the copier can gain knowledge that can lead to increased longevity. However, this finding did not emerge in Study 2A, so future research is needed to replicate this effect.

People seem to copy those who display pride, but how far this bias transfers is not clear. That is, do people copy pride-displaying targets in domains where the target was not observed to display pride? For example, if you observe someone displaying pride after a math test, are you subsequently more likely to copy that person in other domains when no emotion is displayed? On the one hand, pride-displaying targets might be copied regardless of the domain if pride displays signal that the *individual* possesses general skill or knowledge. In other words, pride displays might be interpreted as communicating general trait-like information about targets. If this is the case, it would suggest that the PLB operates as a general tendency regardless of the context in which pride is displayed. This would be akin to saying "this pride-displaying individual is likely to be an expert in most things, so I will always copy him/her." On the other hand, if pride displays signal that a success occurred in that particular *situation*, then copying should be dependent on that situation, since it is likely to be the area of expertise or skill of the target. If this is the case, then pride displays would be interpreted as communicating state-like information about the individual's current emotional experience, and it would suggest that the PLB operates within the specific context where pride is displayed. It would be akin to saying

"this pride-displaying individual is only an expert in this situation, so I will only copy him/her in this case." These competing hypotheses were tested in Study 4.

Study 4

To explore whether the PLB reflects trait- or state-based learning biases, I tested the extent to which copying transfers to other domains. Participants were given the opportunity to copy a target answering a trivia question who had previously displayed pride in a particular domain. The domain of the trivia question differed in relevance to the initial domain where pride was displayed. In one condition, the domains were the same (i.e., both questions were related to math), in another condition they were broadly similar but not the same (i.e., both were from academics: math versus biology), and in a third condition the domains were completely unrelated (i.e., math versus sports). If the PLB is evident when domains are the same, it would suggest that the PLB shows at least minimal transfer to highly relevant areas, but is generally used in a state-like manner. A finding along these lines would be consistent with the research reviewed above on how people prefer knowledgeable targets (see section *The Pride Expression and Social Learning*). Indeed, even young children can differentiate the domains of expertise of various experts (Lutz & Keil, 2002), suggesting that knowing the domain of expertise is important.

If the PLB is evident when domains are completely unrelated, it would suggest that the PLB functions in the broadest possible sense, by promoting a form of copying that generalizes even to unrelated domains and is used in a more trait-like manner. This would be consistent with cultural learning that suggests prestigious models are influential beyond their domain of expertise (Henrich & Gil-White, 2001). There are two reasons to expect the PLB to work in this manner. First, selection likely favored a *general* tendency to copy successful social models, as it is costly to figure out what factors contribute to success. Second, some expertise is likely to be relevant in multiple domains, such as problem-solving methods. Together, these points suggest a trait-like bias is likely to emerge. Ethnographic accounts are consistent with this expectation. For

example, among the Meriam (an aboriginal group that live in northern Australia in the Torres Strait), those highly successful at hunting turtles have influence in political decisions, despite their hunting prowess having little to do with knowledge of public affairs (Smith & Bliege Bird, 2000).

Finally, if the PLB is evident when the domains are more broadly similar (but not unrelated), it would suggest that the PLB transfers to more distantly related domains, and that pride communicates a mixture of state- and trait-like information.

Method

Participants and Procedure. 834 undergraduates (49% female) were approached individually on a large university campus, and followed a similar procedure as in Study 2A, with the addition of another trivia question that varied in domain, between-subjects. This created a 3 (confederate emotion: pride versus happy versus neutral) x 3 (domain relevance: same domains versus broadly related domains versus unrelated domains) between-subjects design. Participants first viewed a photo of a same-sex target (who, they were told, was another participant) displaying pride, happy, or neutral ($n_s = 284, 271, \text{ and } 279$, respectively; given the lack of difference between the shame and neutral conditions in the previous studies, the shame condition was dropped) answer an initial math-related trivia question (i.e., “Which number is the closest to the actual value of Pi, π ?”), with response options: “A. 3.141592652, B. 3.141592635, C. 3.141592654, D. 3.141592665, or E. 3.141592721”). Photographed targets indicated (via a caption) that their response was B. Unlike in Study 2B, participants were not asked their answer to this initial trivia question. Instead, they were asked to view the confederate for 30 seconds and imagine that the person was answering the question next to them. Because this study was designed to test whether copying transfers, any copying on this initial question might

subsequently influence copying on the dependent variable, as participants might seek to be consistent with their copying behaviors. As such, copying was only assessed on a subsequent trivia question.

Following the initial trivia question, participants viewed a second trivia question on a separate page, and were incentivized to answer it correctly; they were told that correct responses would earn entries into a \$50 draw. The domain of the second trivia question was randomly varied between participants, as follows: math ("Which number is the closest to the actual value of the square root of 2, $\sqrt{2}$?", with response options: A. 1.4142135623730950, B. 1.4142135623730905, C. 1.4142135623730850, D. 1.4142135623730125, or E. 1.4142135623730599), biology ("What is the smallest bird in the world?", with response options: A. *Mellisuga helenae*, B. *Patagona gigas*, C. *Serinus canaria*, D. *Melospittacus undulatus*, E. *Agapornis*), or sports ("Who won the 1975 rugby league world cup?", with response options: A. Australia, B. Fiji, C. New Zealand, D. France, E. Canada"). These domains were pre-selected to vary from the initial math trivia question such that one (math) was of the same domain as the initial question, another (biology) was of a different narrow domain but the same broad domain of academics, and the third (sports) was of an unrelated domain altogether. This three-level design was chosen so that I could test whether copying transfers to different questions within the same domain, to more distantly related domains, and to entirely unrelated domains. The extent of transfer observed will indicate how the PLB functions. Following the trivia question, participants were told that "the other participant, who you just viewed a photo of, chose option D for this one" and were asked for their response; correct responses were always A. There response to this question functioned as the dependent variable. Basic demographic questions followed.

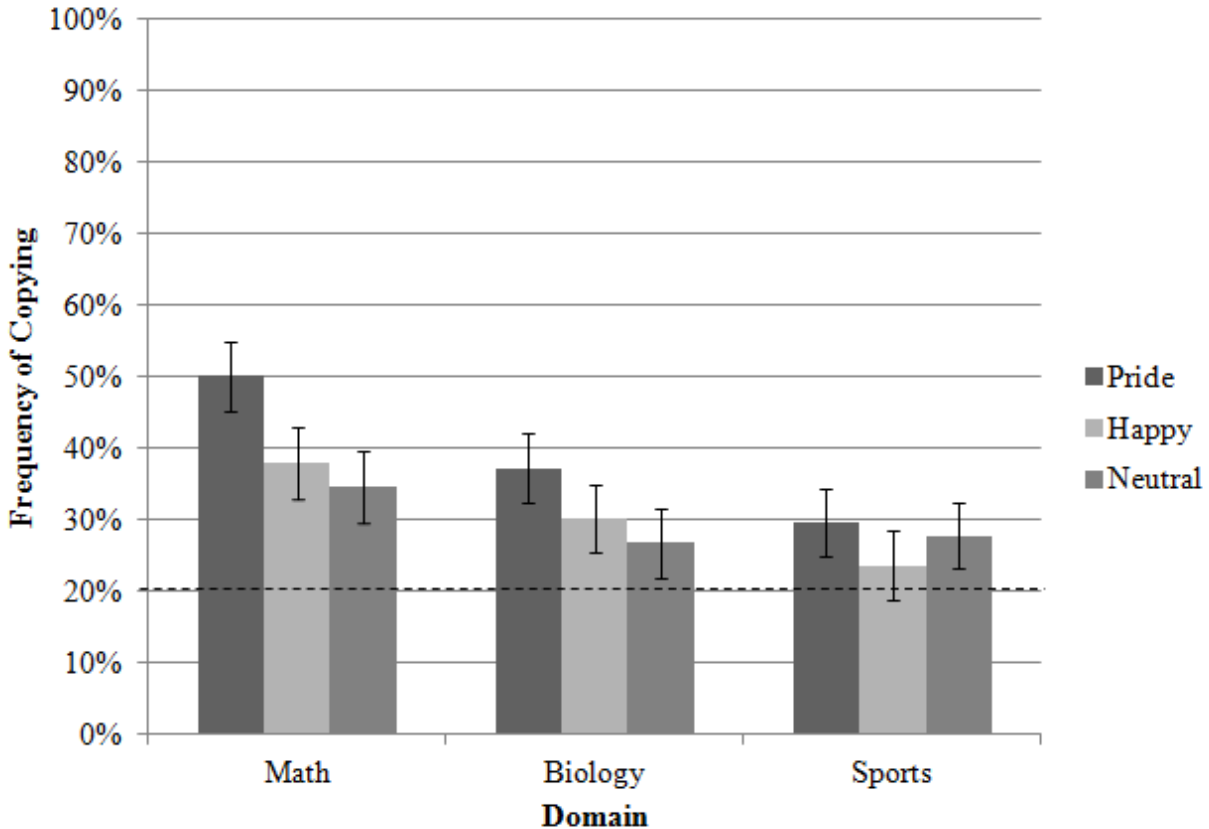
Results and Discussion

Does the Pride Learning Bias Transfer to Other Domains? First, to test whether copying varied by emotion condition and the domain of the trivia question, a 3 (emotion expression) x 3 (domain similarity) ANOVA on copying frequency was run, which revealed no significant interaction, $F(4, 822) = .56, p = .69$. However, main effects of emotion and domain emerged; for emotion, $F(2, 822) = 3.40, p = .03, \chi^2(2) = 6.79, p = .03$; and for domain, $F(2, 822) = 6.29, p = .002, \chi^2(2) = 12.54, p = .002$ (see Figure 6). To make sense of the main effect of emotion, I tested for differences between emotion conditions on copying. Pride-displaying targets were copied most frequently, significantly more than neutral, $t(561) = 2.35$, Cohen's $d = .20, p = .02, \chi^2(1) = 5.47, p = .02$; and happy, $t(553) = 2.10$, Cohen's $d = .18, p = .04, \chi^2(1) = 4.40, p = .04$ (mean copying frequencies for pride, happy, and neutral conditions = 39%, 30%, 29%, respective). Happy and neutral conditions did not differ significantly in copying frequency, $t(548) = .22$, Cohen's $d = .02, p = .82, \chi^2(1) = .05, p = .82$. Based on binomial tests, in all emotion conditions targets were copied significantly more frequently than chance (set at 20% based on the number of response options), $ps < .000, .000, .000$ for pride, happy, and neutral conditions, respectively. Thus, participants were more likely to copy the target's response than guess randomly, regardless of emotion, but they showed a bias toward copying targets who displayed pride. These findings are consistent with participants making trait-like inferences about those who display pride, learning that they are good targets to copy in general.

To make sense of the main effect of domain, I tested for differences between domains on copying. Targets were copied significantly more frequently in the math domain than in the biology domain, $t(541) = 2.33$, Cohen's $d = .20, p = .02, \chi^2(1) = 5.39, p = .02$, and the sports domain, $t(552) = 3.49$, Cohen's $d = .30, p = .001, \chi^2(1) = 11.94, p = .001$, and copying

frequencies for the biology and sports questions did not differ significantly from each other, $t(563) = 1.13$, Cohen's $d = .10$, $p = .26$, $\chi^2(1) = 1.28$, $p = .26$. Thus, participants were more likely to copy the target's response in the math domain than the other domains. This finding suggests that copying is stronger for questions in the same domain as initial question where confederates were initially observed.

Figure 6. Effect of others' emotion displays and the domain of question on the tendency to copy target responses to a difficult trivia question when incentivized.



Note. The interaction between confederates' emotion displays and domain was not significant, $p > .05$. Significant main effects of emotion and domain emerged, $ps < .05$, indicating that pride-displaying confederates were copied significantly more than confederates displaying other emotions, and copying was greater in the domain that was most relevant to the domain where pride was originally displayed. The dotted line represents chance responding (20%); that is, the proportion of participants who would demonstrate copying if they were responding randomly. Error bars represent standard error.

A close examination of Figure 6 suggests that the domain influences the extent to which people copy those who display pride, in particular, despite the absence of a significant interaction. Because of this pattern of results, I conducted exploratory analyses within each domain to determine the extent to which the PLB replicates within each. When the domain of the trivia question was the same as when pride was initially displayed (i.e., math), copying was marginally influenced by target emotion, $F(2, 263) = 2.49, p = .08, \chi^2(2) = 4.95, p = .08$, such that pride-displaying targets were copied most frequently, significantly more than neutral, $t(177) = 2.11, \text{Cohen's } d = .32, p = .04, \chi^2(1) = 4.41, p = .04$; and trending more than happy, $t(177) = 1.63, \text{Cohen's } d = .25, p = .10, \chi^2(1) = 2.64, p = .10$ (mean copying frequencies for pride, happy, and neutral conditions = 50%, 38%, 34%, respectively). Based on binomial tests, in all emotion conditions targets were copied significantly more frequently than chance (set at 20% based on the number of response options), $ps = .000, .000, .001$ for pride, happy, and neutral conditions, respectively. Thus, within the same domain, I replicated the PLB.

A similar pattern of copying pride displaying targets most frequently was observed when the domains were more distantly related (i.e., the academic disciplines of math and biology), $F(2, 274) = 1.24, p = .29, \chi^2(2) = 2.49, p = .29$ ($Ms = 37\%, 30\%$, and 27% for pride, happy, and neutral, respectively), but much weaker when the domains were unrelated (i.e., math and sports), $F(2, 285) = .44, p = .65, \chi^2(2) = .88, p = .64$ (though considerably weaker, participants still demonstrated a pattern toward copying pride more than neutral or happy, $Ms = 30\%, 28\%$, and 24% , respectively). Based on binomial tests, within the biology domain, pride and happy displaying targets were copied significantly more frequently than chance, $ps = .000$ and $.01$, respectively; neutral targets were copied marginally greater than what would be expected by chance, $p = .08$. Within the sports domain, pride and neutral targets were copied significantly

more than chance, $ps = .02$ and $.04$, respectively, but not happy targets, $p = .23$. These more exploratory results suggest that there might be diminished transfer as the domains vary from each other, such that people copy those who display pride less frequently as the differences between domains increase. This would be consistent with a state-like function of pride displays, where observers learn that targets are knowledgeable in related domains to where pride was displayed. However, these analyses should be interpreted with caution as they were exploratory, and as there was *no* significant interaction between emotion and domain.

Consequently, the results of Study 4 indicate that the tendency to copy pride-displaying targets shows transfer to other domains (but where the targets' expressions are not visible) that are unrelated to the initial domain where the targets' expressions were known. This indicates that, when used to copy, pride displays are interpreted in a trait-like manner that indicates that targets might possess general knowledge. Thus, pride displays seem to function as broad signals of expertise, rather than specific signals about the situation in which pride was displayed. This finding is consistent with theories of cultural learning (e.g., Henrich & Gil-White, 2001), and suggests that this general tendency to copy pride-displaying social models might be adaptive, if copying saves costs that observers would otherwise incur if individual learning were undertaken.

Although the PLB has now been successfully replicated with a large sample of participants, the participants in the studies described thus far were drawn entirely from a Western population (i.e., Canadians or those living in Canada), which is not likely to be representative of the greater world population (see Henrich, Heine, & Norenzayan, 2010). These findings, thus, cannot address the question of whether the PLB is likely to be a human universal. To address this question, in Study 5, I tested the PLB in a sample of participants from a traditional small-scale society that has limited contact to the rest of the world.

Study 5

The previous studies established that the universal pride expression is used by undergraduates at a Canadian university as a cue that biases their social learning. As a universal display, pride expressions might also be functionally used in a similar manner cross-culturally. Although universality does not guarantee such an effect (i.e., the expression might be universal, but could function differently across cultures), it raises the possibility that this is the case. From a theoretical standpoint, a universal expression would be well-suited to function as a universal learning cue, as it is already present across cultures. Indeed, pride expressions do implicitly communicate high status universally (Tracy, Shariff, Zhao, & Henrich, 2013), suggesting that at least one function of pride displays (i.e., to communicate status differences) is universal. Thus, the PLB might operate cross culturally.

In order to test this possibility, it is important to examine the operation of the PLB among participants from populations that are maximally divergent. Utilizing maximally divergent cultures that vary in key respects ensures that the cultures are highly unlikely to have learned from each other the given behavior or phenomenon (Norenzayan & Heine, 2005; for a classic example in emotion recognition, see Ekman & Friesen, 1971). In Study 5, Fijian villagers living in Yasawa island, Fiji were recruited as participants. Specifically, the study was conducted at a field site on the island with access to six villages of roughly 100-350 villagers each. Villagers subsist primarily off farming yams and cassava, as well as fishing and littoral gathering. They have limited routine access to the outside world, and no postal service or public utilities. That is, villagers are essentially cut off from the Western world. In addition, they have strict norms against overt status displays. That is, those not ascribed high status are not permitted to elevate their status through displays, such as pride, and high status individuals must also avoid high

status displays and are instead expected to downplay their status superiority. High status is instead highlighted through rituals and daily practices that are governed by protocols based on status (e.g., a high status prefix is used when referring to higher status group members; higher status individuals have their homes built on an artificially raised platform; and order of speaking, sitting, and eating are based on status). Even in success situations where pride would typically be displayed in Western cultures (e.g., scoring in a rugby game), pride displays are suppressed and only minimally displayed (Tracy, Shariff, Zhao, & Henrich, 2013). These norms act against displaying pride among Fijians (i.e., pride displays are not normative), so if Fijians show evidence of the PLB, it would strongly suggest that it is a cross-cultural bias. That is, because of norms that act against pride displays, Fijians are unlikely to have developed cultural norms to copy those who display pride. In this way, Fiji provides a maximally divergent culture, and it is thus a tough test of the PLB.

Still, there are reasons to expect the PLB to be present in this culture, as pride is universally, implicitly, and automatically perceived as a high-status display, including by Fijians from the same population (Tracy et al., 2013). In this prior work, Fijians were presented with photos of happy-, pride-, shame-, or neutral-displaying targets and asked to rate their status. Results showed that those displaying happiness were *explicitly* rated as higher in status than those displaying pride. Although this finding is seemingly at odds with pride displays being associated with high status, it is consistent with Fijian cultural norms regarding the suppression of overt status displays. Importantly, social norms are expected to influence explicit judgments more than implicit judgments (Banse, Seise, Zerbis, 2001). Indeed, when Fijians categorized the same expressions *implicitly* using an Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998), those displaying pride and happiness were equally strongly associated with

high status. More specifically, Fijians completed a series of IATs where they categorized photos of pride displays and other emotion displays with high status and low status words. Response times were faster when pride photos were paired with high status words and other expressions (i.e., shame and neutral) with low status words than the reverse pairings, but there was no difference when pride photos were compared with happy photos. This finding suggests that pride and happiness are equally strongly implicitly associated with high status concepts among Fijians. Together, these findings suggest that, among Fijians, the association between pride and high status is suppressed on an explicit level, but on an implicit level pride is considered a high-status display. Thus, these findings suggest that pride displays might also bias Fijian's learning behavior. If Fijian participants demonstrate evidence for the PLB, it would be the first evidence to suggest that it is a human universal.

Method

Participants and Procedure. One-hundred adult Fijian villagers (50% female) completed a modified version of the procedure used in Study 2A in exchange for two Fijian dollars (approximately \$1 CAD). This sum of money was deemed appropriate payment by researchers familiar with the population. Participants were tested individually in their village. Specifically, participants were asked to answer a trivia question while viewing a laminated photo of another individual. Because most of the Fijian villagers are illiterate, in lieu of viewing a caption with the photo conveying the target's answer to the trivia question, they heard a pre-recorded voice of a native Fijian stating his answer to the trivia question as a single statement, in Fijian. All of the materials were first translated from English into Fijian, then back translated into English to ensure that they conveyed the intended message. To motivate participants to seek

correct answers, they were told that a correct response on the trivia question would earn them an additional two Fijian dollars. Finally, participants were asked basic demographic questions.

Stimuli.

Images. Participants viewed a photo of a Black male, taken from the previously validated UCDSSE (Tracy, et al., 2009) printed on an 8 x 11” piece of laminated paper. A single target was necessary because of the limited number of potential Fijian participants. A Black target was selected because no Fijian targets were available, and the skin tones of Black and Fijian individuals are similar. In addition, this stimuli has been used successfully in previous studies with villagers from the same region (Tracy et al., 2013). Participants were randomly assigned to view the target displaying pride, happiness, or neutral. The happiness condition is a tough test of the hypothesis, given that happiness and pride are equally associated with high status, implicitly, by Fijians, and explicitly happiness is rated higher in status (Tracy et al., 2013). Given these previous finding, Fijian norms might influence copying, such that happy targets are copied to the same extent (or greater extent) as pride targets. That is, because happy is viewed as a high status display among these participants, they might prefer to copy the happy target because he is behaving in a normative manner that conveys status. If the PLB is universal, however, Fijians should still copy pride-displaying targets as these targets likely possess valuable knowledge. Thus, both pride and happy targets should be copied to a greater extent than neutral targets, but the exact level of copying expected between pride-displaying and happy-displahying models is less clear.

Voice recording. A native Fijian's voice was recorded in his native tongue, in a neutral tone, stating, "I think New Zealand won the 1975 rugby league world cup.” Hearing this single statement was deemed necessary to minimize the complexity of the study. That is, given that

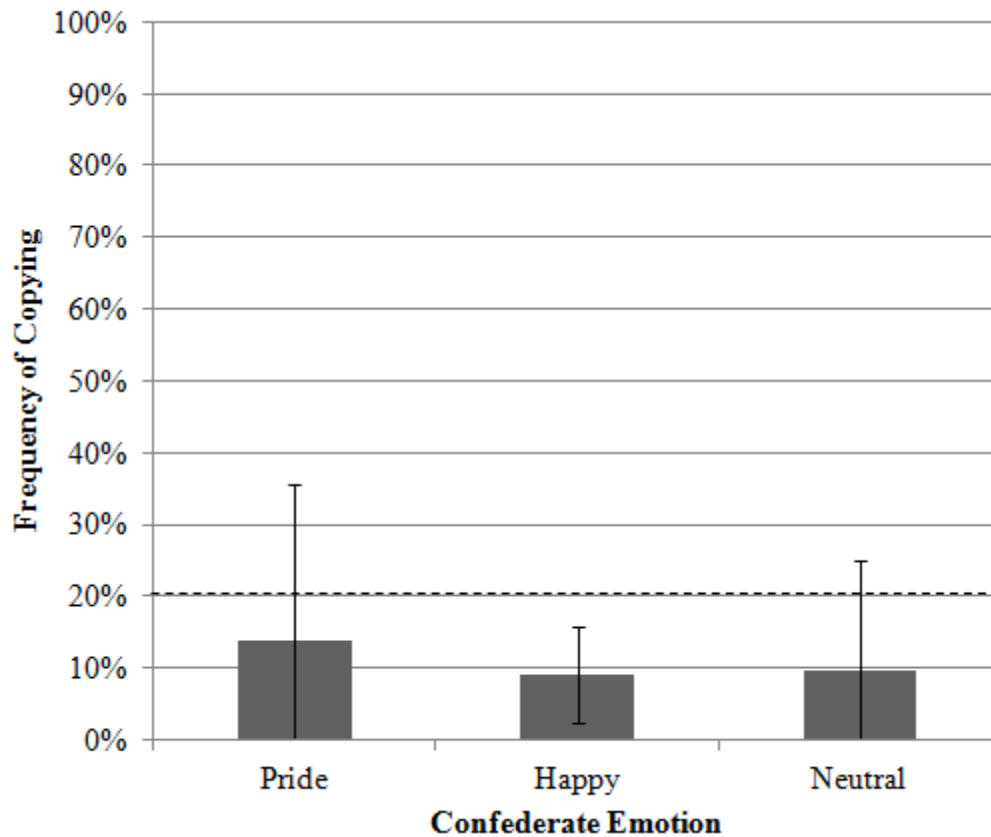
Fijians have limited experience participating in psychological studies, it was deemed that having a separate Fijian read out a trivia question and then hearing the target respond, similar to what was done in Study 2, would add unnecessary complexity to the task which might otherwise confuse participants. Instead, hearing a single statement is a simpler design that conveys the same information. The topic and response was selected based on the criteria that it was something Fijians were somewhat familiar with, yet too difficult for them to likely know the answer. The sport of rugby fits these criteria; the Fijian villagers tend to be fans of rugby, yet their knowledge of it is quite limited. This was based on the opinion of two of my collaborators that were familiar with the Fijian population, both having spent time living in Fiji at the field site.

Responses. Response options were represented on 5 separate 4 x 2" pieces of laminated paper with the National flags of each potential answer printed on them, which were placed in front of participants in random order. Flags were selected in lieu of written names to limit the use of printed text that might otherwise confuse participants. Responses included were New Zealand, Fiji, Australia, France, and Canada. A native Fijian research assistant read aloud, in Fijian, the names of each country while indicating which flag represented it, then the research assistant placed a rock on the flag of New Zealand to indicate the answer of the confederate (correct answer is Australia). As with the previous studies, by having targets answer incorrectly, I can ensure that any copying that occurs is driven entirely by emotion displays and not by participants' prior knowledge about the correct answer. Next, participants were given a different rock and asked to indicate their response by placing it on the appropriate flag. Their response functioned as the dependent variable.

Results and Discussion

First, seven participants were suspected of hearing the correct response from previous participants, so they were removed from the analyses. To test whether the emotion displayed by the confederate influenced copying frequency, a one-way ANOVA of emotion condition on copying frequency was conducted, which was not significant, $F(2, 90) = .20, p = .82, \chi^2(2) = .41, p = .81$. (see Figure 7). Based on binomial tests with chance set at 20%, pride was copied at chance, $p = .28$. Conversely, happy targets marginally *avoided* being copied, $p = .08$, and neutral targets displayed a similar pattern, $p = .11$.

Figure 7. Effect of others' emotion displays on the tendency to copy their responses to a difficult trivia question when incentivized.



Note. None of the differences between emotion conditions were significant, $ps > .05$. The dotted line represents chance responding (20%); that is, the proportion of participants who would demonstrate copying if they were responding randomly. Error bars represent standard error.

Table 3 displays the distribution of answers by emotion condition. It reveals that Fijians showed a clear preference for two responses: Australia and Fiji. In fact, 72% of participants selected one of these responses. Ideally, participants' responses would be roughly equal across the multiple choice options when they do not copy the social model, which would indicate random guessing and suggest that the question is sufficiently difficult to encourage social

learning. The fact that this did not emerge suggests that the multiple choice question used was inappropriate to test the hypothesis. Furthermore, because Australia was the correct answer and Fiji is participants' native country, one possible explanation for this pattern of responses is that some participants might have known the correct response and selected Australia, while others were showing an ingroup bias (Brewer, 1979) toward their own country and selected Fiji. This pattern suggests that the rugby question was not ideal. Future research might benefit from utilizing a different question that does not have such a strong bias toward certain answers.

Table 3

Frequency of Participants' Answers by Emotion Condition.

Emotion condition	<u>Answer</u>					Total
	Australia	Fiji	France	New Zealand	Canada	
Pride	7	13	5	4	0	29
Happy	13	12	4	3	1	33
Neutral	12	10	3	3	3	31
Total	32	35	12	10	4	93

Note: Values represent the number of participants that answered a particular way. Responding with New Zealand represents copying.

The results of Study 5 failed to replicate the PLB among Fijians. In fact, Fijians showed very little copying. Null results are inherently difficult to interpret, but this null effect might have emerged for two reasons: 1) the PLB is a cultural specific bias that is not universally used to bias

learning, or 2) Study 5 failed to adequately test the hypothesis. Although possibility 1 is not ruled out, there was a hint that possibility 2 was the case. That is, although the pride-displaying target was copied at chance, copying the neutral- and happy-displaying targets was even lower, such that copying happy targets was showing a trend toward being avoided (though only a marginal effect) and copying neutral targets showed a similar pattern of being avoided. Importantly, interpretations of this pattern should be made very cautiously, as the cell sizes were extremely small. If true, however, this pattern might suggest that, even though targets in general were avoided, pride-displaying targets were not avoided to the same extent, possibly because they possess knowledge. This would indicate a much weaker PLB among this sample. However, any conclusions at this point are especially premature.

One explanation for the low frequency in Fijians' copying tendencies is that the target was an outgroup member. The previous studies on the PLB used samples consisting of Western undergraduates, and the target was described as a fellow student, thus making the target an ingroup member. Given that cross-culturally people show less trust for an outgroup member than an ingroup member (Yuki, Maddux, Brewer, & Takemura, 2005), it could be the case that Fijian participants were less trusting of the targets compared to Western participants, and Fijians were consequently less likely to copy the targets. Indeed, copying frequency decreases as trust in the social model decreases (Harris, 2007). Unfortunately, there is no readily available emotion expression stimuli of Fijians, so I opted to use an available target whose skin tone was closest to native Fijians; however, the target was still clearly *not* Fijian, so future research should first develop stimuli of ingroup members and then test the PLB. Consequently, the results of this study are inconclusive as to whether the PLB is a human universal.

Another potential factor that decreased copying frequency is the incentive. Two Fijian dollars might not have been enough to adequately motivate participants to seek knowledge. Given the small sizes of the villages where participants were drawn from, there was a concern about saturating the market, so it was decided against using a larger incentive. However, this decision might have reduced Fijians' tendency to copy for informational reasons. Consequently, because of these various concerns, the universality of PLB is unclear.

In the next two studies, I addressed questions about the cognitive underpinnings of the PLB. In the previous studies, it is unclear whether participants were consciously deciding that proud social models are better targets to copy, or whether this decision to copy was made automatically. Studies 6 and 7 tested whether the PLB is automatic by looking at whether it occurs without awareness and is an efficient process. Importantly, failing to find support for one of these types of automaticity with the PLB would not necessarily mean that the PLB is not automatic; instead, it would suggest that the PLB is not automatic in a particular way (Bargh, 1999). Although these types of automaticity are considered distinct, in practice it can be difficult to tease them apart as they likely interact with each other (Payne, 2012). Still, testing for these different forms of automaticity allows for a more specific, nuanced understanding of how the PLB functions.

Study 6

Awareness and the PLB

Awareness refers to whether a person is aware of a) the stimulus or b) its effect; if the person is unaware of either of these, it is considered automatic. Although these forms of awareness are slightly different, in practice they often have the same effect (see Bargh, 1994). Subliminal priming studies test whether conscious awareness of a stimulus is necessary for an effect, while supraliminal priming studies test whether awareness of its effect is necessary for an effect to emerge. For example, Murphy and Zajonc (1993) found that when they subliminally flashed facial expressions of happiness or anger for only 4 ms, participants' liking of novel Chinese ideographs was affected in emotion-specific ways, even though participants were not aware of the flashed stimulus. Similarly, Niedenthal and Cantor (1986) found that supraliminally exposing participants to nonverbal affective primes for 10 seconds also affected their subsequent judgments in emotion-specific ways, and this effect emerged without participants' awareness of the effect of these primes. Taken together, these results suggest that affective primes do not require awareness of either the stimulus or its effect in order to function.

There are reasons to believe that the PLB occurs without awareness. First, such a bias would take advantage of fleeting emotion expressions that might otherwise be missed by slower conscious deliberation. Relying on conscious processes might additionally weaken the bias through other competing conscious processes. In addition, results of Study 4 suggest that the PLB does not require awareness of the effect in order to function, as the methodology was similar to that of supraliminal priming studies. That is, participants were supraliminally primed with an emotion when they viewed the confederate answer the initial trivia question, and this prime subsequently influenced their copying behavior when no emotion image was present.

However, supraliminal priming studies typically do not use primes that are related to the dependent variable, as was the case in Study 4 (i.e., participants were told the answer of the target—the prime—to the second trivia question—the dependent variable), which makes this conclusion less certain—in this case, participants may have been knowingly applying what they knew about the target to best perform the trivia task.

In Study 6, I tested whether an awareness of the stimulus is necessary for the PLB by running a subliminal priming study, in which participants were unaware of the target stimulus. I hypothesized that the PLB should occur without an awareness of the stimulus. If the PLB occurs without participants' awareness of having viewed pride displays, it would suggest that the PLB can take advantage of fleeting emotion expressions, and that it does not require controlled processing to interpret pride displays, which would otherwise slow down the PLB and compete with other controlled processes.

Method

Participants and Procedure. 291 undergraduate participants (71% female) completed two tasks on a computer in the lab in exchange for course credit. First they completed a cognitive task (which was actually the priming task), followed by a trivia question video task. They were told the same cover story as Study 3, that the study was testing their ability to do a task while distracted. Once these tasks were completed, basic demographic questions and a funnel debriefing followed.

As in Study 3, after the tasks were completed, participants were probed for prior knowledge of the trivia question and suspicion of the study, which determined whether they were included in analyses. First, those reporting recognizing the confederate were removed ($n = 28$), as any prior knowledge of the confederate could influence responses. This removal was

particularly important, given that the confederate had been a contestant on the reality television show *Big Brother Canada*. Those knowing the answer to the trivia question ($n = 49$) were removed, given that these people most likely responded on the basis of their own prior knowledge rather than by copying. Next, I used a funnel debriefing method to remove participants who demonstrated any level of suspicion (Bargh & Chartrand, 2000). Specifically, participants were first asked if they noticed "anything suspicious about this study," and were removed if they responded in the affirmative ($n = 32$). Next they were asked if they noticed anything suspicious about "the experimenter"; an additional 4 participants responded yes and were removed. Third, they were asked if they noticed "anything suspicious about the symmetrical/asymmetrical task"; 19 participants did and were removed at this stage. Fourth, they were asked if they noticed "anything suspicious about the trivia question task"; 44 participants did and were removed at this stage. Finally, they were asked if they noticed anything suspicious about "the individual in the video"; 2 additional participants were removed. Although this resulted in a large number of exclusions due to suspicion, as in Study 3, the fact that many of these individuals were appropriately suspicious (e.g., of the "individual in the video") in ways that would affect results, but only revealed this to be the case after thorough probing, demonstrates the importance of using a funnel debriefing method. After these exclusions, I retained a final sample of $N = 113$ (75% female) with 48, 35, and 30 participants in the pride, happy, and neutral conditions, respectively. The proportion of participants removed due to suspicion did not significantly differ between conditions, $\chi^2(2) = 1.73, p = .42$. For results of the entire sample, please see Appendix B.

Finally, participants were asked "in the symmetrical/asymmetrical sorting task, did you notice an image being flashed very quickly?" and then, if they answered in the affirmative, were

asked to provide as many details as possible about what they saw. Importantly, participants were previously warned that an image might be flashed during the task (see *Priming Task* section below), so, unsurprisingly, 51% of the entire sample claimed they saw an image flashed. None of the participants, however, correctly identified the emotion displayed in the prime. Some were able to correctly identify that the image was the same individual as in the video, but many details that participants said were flashed were not actually present in either the sorting task or the prime, such as "a building", "a child", "a square like object", "a background scenery", "a maze", and "it was colorful and detailed", which suggests that participants were guessing that the prime was of the confederate. These results suggest that the prime was effectively outside of participants' awareness.

Priming Task. Participants completed a cognitive sorting task, in which they indicated whether a series of target images are symmetrical or asymmetrical (Murphy & Zajonc, 1993). To be consistent with the cover story (that the study tested distraction) and to prevent participants from being startled if they become aware that something was quickly flashed (which might adversely affect results), participants were told that an image may appear very quickly in order to distract them, but to otherwise ignore it. Participants were then asked to stare at a fixation point on a computer monitor, which appeared for 1 second. Next, an image (i.e., the prime) was subliminally flashed for 10 ms. Then a symmetrical or asymmetrical image (determined at random) appeared on-screen and participants either responded with the 'E' key, if it was symmetrical, and the 'I' key, if it was asymmetrical. Once the key was pressed, there was a 500 ms delay until the fixation point appeared again and the next trial began. This pattern continued for 20 trials.

Participants were randomly assigned to see one of three expressions, between-subjects, during the subliminal prime: pride, happy, or neutral. The primes were screenshot images of the same confederate participants saw in the video task, which was the same video used in Study 3 and is described in more detail below, displaying the intended emotion. To reduce the likelihood that participants were made aware of the prime through repeated exposure, half of the trials contained a blank image in lieu of the prime, which were determined at random.

Video Task. The video portion of the study was similar to the procedure of Study 3. That is, participants were told that the study examined people's judgments while distracted. To accomplish this, they were asked to complete two tasks: (a) watch a video of a male confederate answering a trivia question, in order to make subsequent judgments about him, and (b) answer the same trivia question within 2 seconds after watching the video. Participants were incentivized to answer correctly; they were told that correct responses would earn an entry into a \$50 draw. The confederate in the video always displayed a neutral posture and expression. The individual in the prime and video were the same person to increase the likelihood that, to the extent that the prime was perceived, it was associated with the target in the video.

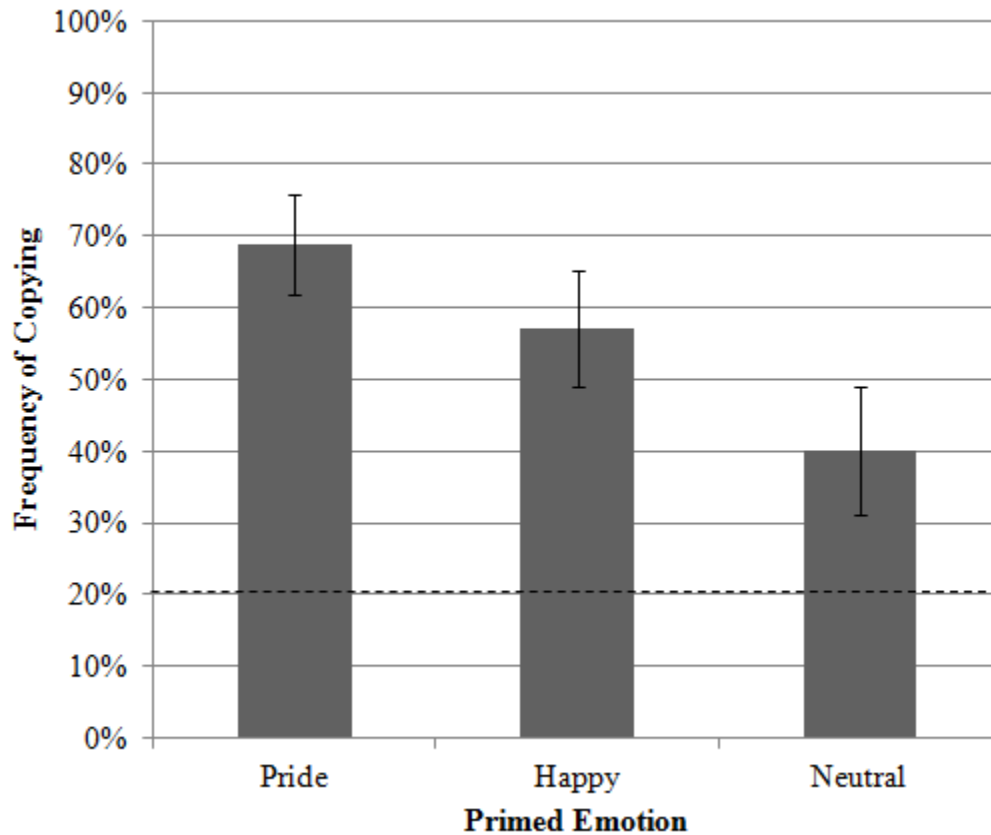
Stimuli. Participants viewed a video of a male confederate answering, aloud, a trivia question that was read by an off-screen experimenter. The confederate was Caucasian in his early twenties. The trivia question was: "Which of the rivers below is the longest?" followed by response options: "A. Mackenzie, B. Lena, C. Niger, D. Ob, or E. Congo" (correct answer D). The confederate answered C. As in prior studies, the confederate answered incorrectly to ensure that any copying that occurred would be driven entirely by emotion displays and not by participants' prior knowledge about the correct answer. Copying was assessed on the basis of whether participants selected the same answer to the trivia question as the confederate.

Throughout the video, the confederate displayed a neutral posture and expression as he stood in a relaxed posture without raising or lowering his head or smiling.

Results and Discussion

Does the Pride Expression Promote Copying Without Awareness? To test whether the emotion display primes influenced copying, a one-way ANOVA of prime on copying was run, which was significant, $F(2, 110) = 3.22, p = .04, \chi^2(2) = 6.25, p = .04$. (see Figure 8), such that those who were primed with a pride-displaying confederate were more likely to copy the subsequent neutral-displaying confederate most frequently, more than when primed with a neutral-displaying confederate, $t(76) = 2.57, \text{Cohen's } d = .59, p = .01, \chi^2(1) = 6.25, p = .01$; but not significantly different from when primed with a happy-displaying confederate, $t(81) = 1.80, \text{Cohen's } d = .40, p = .28, \chi^2(1) = 1.18, p = .28$ (copying frequencies for pride, happy, and neutral = 69%, 57%, & 40%, respectively). Copying was not significantly different when primed with a happy-displaying confederate compared to a neutral-displaying confederate, $t(63) = 1.38, \text{Cohen's } d = .35, p = .17, \chi^2(1) = 1.90, p = .17$. Based on binomial tests, targets were copied significantly more frequently than would be expected by chance (20%) when primed with pride-, happy-, and neutral-displaying confederates, $ps = .000, .002, \text{ and } .01$, respectively. Thus, participants copied the confederate greater than chance, but were particularly likely to copy the confederate if first primed with a pride- displaying confederate. However, the lack of a significant difference between pride and happy primes suggests an effect of positive valence that might not be due to pride.

Figure 8. Effect of emotion priming on the tendency to copy a target's response to a difficult trivia question when incentivized.



Note. Only the difference between pride and neutral was significant, $p < .05$; no other significant differences between conditions emerged. The dotted line represents chance responding (20%); that is, the proportion of participants who would demonstrate copying if they were responding randomly. Error bars represent standard error.

Subsidiary Analyses. In the previous analyses, those reporting knowing the answer to the trivia question were removed because they are not likely to rely on social learning. However, those who reported knowing the answer to the trivia question but answered it *incorrectly* might still rely on social learning. That is, they actually did not know the correct answer, as indicated

by their incorrect response, so they might still unknowingly rely on the knowledge of others. Consequently, I ran the analyses again with this new exclusion criteria (with suspicious participants removed using the same criteria as above; $N = 139$, which meant the inclusion of an additional 26 participants, $n_s = 57, 42, \& 40$ in pride, happy, and neutral conditions, respectively). A one-way ANOVA of emotion prime on copying was marginally significant, $F(2, 136) = 2.93, p = .06, \chi^2(2) = 5.74, p = .06$. Those who were primed with a pride-displaying confederate were more likely to copy the subsequent neutral-displaying confederate, more than those primed with a neutral-displaying confederate, $t(95) = 2.35, \text{Cohen's } d = .48, p = .02, \chi^2(1) = 5.32, p = .02$; but not significantly more than those primed with a happy-displaying confederate, $t(97) = 1.63, \text{Cohen's } d = .33, p = .11, \chi^2(1) = 2.63, p = .11$ (copying $M_s = 68\%, 52\%, 45\%$, for pride, happy, and neutral conditions, respectively). Copying was not significantly different between happy and neutral primes, $t(80) = .66, \text{Cohen's } d = .15, p = .51, \chi^2(1) = .45, p = .50$. Based on binomial tests, targets were copied significantly more frequently than would be expected by chance (20%) when primed with pride-, happy-, and neutral-displaying confederates, $p_s = .000, .000, .000$, respectively. Thus, participants copied the confederate more frequently than chance, but were particularly likely to copy the confederate if first primed with a pride-displaying confederate. Once again, there was no significant difference between pride and happy primes. Though pride primes were almost marginally different from happy primes ($p = .11$). This pattern might suggest that copying effects are not solely due to positive valence, but possibly failed to reach significance because of sample size issues.

Overall, results suggest that those who were primed with a pride-displaying confederate were more likely to copy the neutral-displaying confederate in the subsequent video than those who were primed with a neutral-displaying confederate. The effect of happy-displaying primes is

less clear, given that, in both analyses, happy primes were neither significantly different from pride or neutral primes. If future research suggests that pride is no different from happy primes, this would suggest that positive valence influences copying behavior, such that subliminally priming either pride or happy expressions increases copying over neutral primes. This would be consistent with the results of Winkielman and colleagues' (2005) studies that found that subliminal exposure (i.e., a 16 ms prime) to images of people displaying happiness led to an increase in drink consumption only for thirsty participants, compared to subliminal angry or neutral primes. The authors put forth an motivation-affect model to explain these results, which suggests that someone's initial motivation is influenced by the valence of primes, where positive valence is thought to enhance already present motivations. Applying this model to the results here, it would suggest that pride and happy displays both lead to increased copying because the positive valence of these displays enhances participants' desire to copy (i.e., participants' motivation to copy was likely high because they were incentivized for correct responses, which likely increased social learning goals; see Henrich & Henrich, 2007). Future research is needed to determine whether this is the case, but for now, we can conclude that pride primes influence participants' automatic copying tendencies, but it is unclear whether this is simply a positive valence effect or something unique to pride displays.

Another explanation for the failure to find a difference between pride displays and happiness is that the 10 ms prime might not be long enough to differentiate pride displays from happy displays. That is, participants might have been unsure, on an implicit level, that pride was displayed during this brief exposure, which might have affected copying such that copying frequencies between the happy and pride conditions were the same. If this is the case, then a study that sufficiently increases the prime duration so that participants can differentiate the

display would be expected to show significant differences between these conditions. A third possibility is that the study lacked sufficient power to test the hypothesis. Happy primes were neither significantly different from pride or neutral primes, but pride primes were different from neutral ones. This suggests that with a larger sample, the differences between pride and happy primes might prove to be significant (which was nearing marginal significance in the subsidiary analyses; $p = .11$).

Next, I tested another aspect of automaticity on the PLB; whether the PLB is an efficient process.

Study 7

Efficiency and the PLB

A process is efficient, and thus automatic, if it occurs without relying on working memory. Cognitive load studies that tax working memory typically test the efficiency of processes. For example, one study found that utilitarian moral judgments (i.e., ones that maximize benefits while reducing costs, such as judging that it is ok to kill one person if it saves 5 people) are influenced by the addition of another cognitively demanding task (i.e., cognitive load), while non-utilitarian moral judgments (i.e., ones that are concerned with rights and rules, such as judging that it is never ok to kill another person, regardless of how many others are saved as a result) are not, suggesting that non-utilitarian moral judgments, but not utilitarian moral ones, are efficient (Greene, Morelli, Lowenberg, Nystrom, & Cohen, 2008). The authors concluded that these findings are consistent with dual-process models, where utilitarian judgments rely on controlled processing, while non-utilitarian judgments rely on more automatic emotional processing. This suggests that when cognitive resources are unavailable, the emotional processing that influences moral judgment is unaffected, and this processing is thus efficient.

There are reasons to expect that the PLB might also be an efficient process. First, this would be consistent with the findings of Study 3, which employed a time-constraint that taxed cognitive processes to a greater extent than if no time constraint were employed. It would also be consistent with dual-process models that suggest that emotional processing does not rely on working memory (e.g., Evans & Stanovich, 2013; Greene, et al., 2008). If the PLB is efficient, this would mean that it requires few cognitive resources in order to function. This would be adaptive because any conscious deliberation regarding whether to copy pride-displaying others would not only tax resources that could be used elsewhere, but would potentially squander

learning opportunities by delaying or overriding copying behavior with conscious thought. In addition, people are likely to be distracted with other processing duties in the real world, so an efficient PLB would ensure that it still occurs in cognitive demanding real world settings. For all of these reasons, I hypothesized that the PLB would still be evident even with the addition of cognitive load.

Method

Participants and Procedure. 455 undergraduates (62% female) completed the study in the lab in exchange for course credit. The study was conducted on a computer. Participants were told that their ability to do an imagination task while distracted was being tested. Participants were randomly assigned to a load or no-load condition, and the tasks were described to them. In the load condition, cognitive load was increased by asking participants to remember an 8-digit number for later recall. Participants were then asked to answer a trivia question while viewing a photo of another person doing the same. After answering the trivia question, participants were asked to recall the 8-digit number. In the no-load condition, participants completed the study without being asked to remember or recall the 8-digit number. Finally, the study ended after participants answered basic demographic questions.

Importantly, participants were also randomly assigned to a pride, neutral, or happiness condition ($n_s = 152, 154, 149$, respectively), which determined the expression shown by the individual in the picture. This created a 2 (load versus no-load) x 3 (pride versus happy versus neutral) design. Because cognitive load should not have an impact on efficient processes, it is expected that there will only be a main effect of emotion, but no interaction between emotion and load.

Digit Recall Task. Cognitive load was increased by asking participants to remember an 8-digit number for later recall. They were given 3 seconds to view the 8-digit number; previous research has given 2 seconds to view a 6-digit number (Bargh & Tota, 1988), and 3 seconds was verified by pilot testing to be an adequate amount of time to view the number, but not long enough for participants to write down the number or otherwise cheat. Immediately after the time expired, the trivia question and accompanying photo appeared, after which participants were asked to recall the 8-digit number.

Trivia Question Task. All participants were asked to answer a trivia question while viewing a photo of another person doing the same, and to imagine that the other person was another participant. To motivate participants to seek correct answers, they were told that correct responses would earn entries into a \$50 draw. Participants had 15 seconds to read and answer the trivia question. These times were determined by pilot testing to be long enough to accomplish the desired task, but not so long that they would have time for conscious deliberation.

Stimuli. Participants either viewed a photo of a Caucasian male displaying a pride, happy, or neutral expression, taken from the previously validated UCDSEE (Tracy, et al., 2009). Participants viewed the photo on a computer screen. Directly below the photo was a trivia question: “Which number is the closest to the actual value of Pi, π ?”, with response options: “A. 3.141592652, B. 3.141592635, C. 3.141592654, D. 3.141592665, or E. 3.141592721” (correct answer C). Photographed targets indicated (via a caption) that their response was B. As in prior studies, by having the targets always answer incorrectly, it was ensured that any copying that occurred would be driven entirely by emotion displays and not by participants’ prior knowledge about the correct answer.

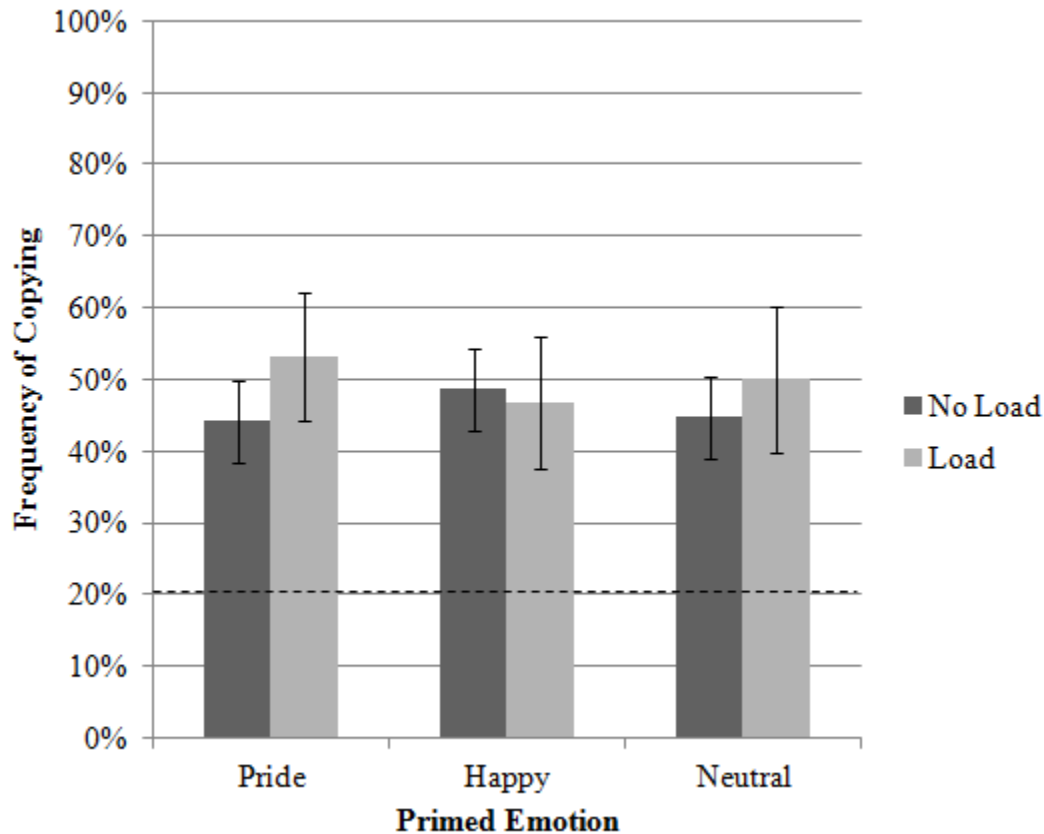
Results and Discussion

Digit Recall. Of those in the load condition, 10% of participants correctly recalled the 8-digit number in its entirety, and 38% (including the 10% who correctly recalled the number) were able to recall 5 or more of the 8 digits correctly. Recall did not vary by emotion condition, $F(2, 225) = 1.15, p = .32$ (M_s for pride, neutral, and happy = 4.17, 3.59, 3.81, respectively; scores represent the number of digits recalled correctly in the 8-digit number). Consistent with previous practices (e.g., Tracy & Robins, 2008a), participants who made 3 or more errors in the digit recall task were removed from subsequent analyses, which left a sample of $N = 313$ to be used in the main analyses ($n_s = 109, 104, 100$, for pride, happy, and neutral conditions, respectively). Although this resulted in removing a large proportion of participants in the cognitive load condition, their low score on the digit recall task suggests that they were insufficiently motivated to complete the task.

Does the Pride Expression Efficiently Promote Copying? To test whether cognitive load had an influence on the emotions targets displayed, a two-way between subjects ANOVA of emotion condition by cognitive load on copying was run, which, as expected, was not significant, $F(2, 307) = .27, p = .77$. There was also no main effect of cognitive load, $F(1, 307) = .41, p = .52, \chi^2(1) = .44, p = .51$ (copying $M_s = 46\%$ and 50% for no load and load, respectively). Unexpectedly, however, there was also no main effect of emotion, $F(2, 307) = .02, p = .99, \chi^2(2) = .09, p = .96$ (copying $M_s = 49\%, 48\%$, and 47% for pride, happy, and neutral, respectively). Indeed, as can be seen on Figure 9, copying varied little between conditions (copying M_s within no load condition = $44\%, 49\%$, & 45% for pride, happy, and neutral, respectively; and within load condition = $53\%, 47\%$, & 50% for pride, happy, and neutral, respectively). Across conditions, copying was greater than what would be expected by chance (20%), $p = .000$. Thus,

even in the no load condition, Study 7 failed to replicate the previous finding that pride-displaying targets are copied most frequently.

Figure 9. Effect of others' emotion displays by cognitive load on the tendency to copy target responses to a difficult trivia question when incentivized.



Note. None of the differences between emotion conditions were significant, $ps > .05$. The dotted line represents chance responding (20%); that is, the proportion of participants who would demonstrate copying if they were responding randomly. Error bars represent standard error.

It is unclear what might have caused this failure to replicate the PLB in the control (no load) condition. Given that the PLB has been successfully replicated with large sample sizes, this null result is puzzling. However, there are differences in the procedures used in this study and the ones that used a similar design (i.e., studies that had participants view a photo along with a

caption that indicated the confederates' answers; Studies 2A and 4). Unlike the prior studies, this study recruited participants who wanted to receive course credit through a university human subjects pool, and who came into the lab and completed the task on a computer. In contrast, participants in the prior studies were approached on campus, asked to participate in exchange for limited compensation (i.e., entry into a draw to win \$50), and did so on a paper survey. One possibility is that those who were approached on campus and participated for limited compensation were particularly motivated to succeed on the task in order to gain their reward (i.e., entry into a draw to win \$50 for correctly answering the trivia question), to justify their participation. On the other hand, those recruited through the human subjects pool for course credit had ample justification for participating (i.e., course credit), and likely did not feel the same internal pressures to succeed on the task—in fact, the incentive offered for success may have seemed particularly meager to these participants, as it might have been implicitly compared with the much greater compensation they were already receiving regardless of their performance. If this is the case, the control condition in this study can best be compared to Study 2B where no incentive was provided for accurate responses, and where pride copying rate was 39%. If this interpretation is correct, it highlights the importance of adequately motivating participants to seek knowledge. Given this issue and the failure to replicate the PLB in the control condition, the results of Study 6 should be considered inconclusive.

Given the number of studies that I have presented on the PLB and the varying strength of the effect that has emerged across studies, two small meta-analyses were conducted to gain a clearer understanding of the effect: one using the samples presented in the main text (which, in some cases, included participants removed due to suspicion), and another using the entire sample from each study (i.e., including suspicious participants who were removed from analyses

reported in the main text). This latter meta-analysis was run with the full samples to account for the fact that some studies excluded a large number of participants. If the meta-analysis is consistent with the PLB using the full samples, with suspicious participants, any fears about potential confounds introduced with these exclusions can be calmed.

Meta-Analyses

Two meta-analyses were conducted on the studies that tested the PLB (i.e., all studies except Study 1, which tested the automatic association between pride displays and knowledge, and Study 2B, which did not include an incentive) on the more stringent comparison between pride displays and happy displays on copying. This criterion provides a conservative estimate of the PLB, as there is reason to believe that happy displays might lead to copying behavior as well as pride displays (see *Results and Discussion* section of Study 3). In addition, comparisons between pride displays and neutral displays on copying were included, as neutral might be a better baseline comparison than happy. Effect sizes (i.e., Cohen's d scores) and sample sizes from the selected studies (see Table 4) were run through Cumming's (2011) meta-analysis module in Exploratory Software for Confidence Intervals, using a random effects model (as suggested by Cumming, 2012). The first meta-analysis included data that was presented in the main text, while the second meta-analysis included data from participants that were excluded from analyses presented in the main text due to suspicion (i.e., the full data set, with no exclusions). Because a large number of participants were cut in some of the studies, which might have unintended consequences on the results, including the full sample in the meta-analysis should ease any concerns about the large number of exclusions. The overall effect sizes are presented below.

Table 4

Summary of Data Included in The Two Meta-Analyses.

Studies	Cohen's <i>d</i>		<u>Sample sizes per condition, <i>n</i></u>			Meta-analysis	Method
	<i>Pride vs</i>	<i>Pride vs</i>	Pride	Happy	Neutral		
	<i>Happy</i>	<i>Neutral</i>					
2A	.40	.28	104	104	108	1, 2	Photo
3 *	.65	1.17	15	18	19	1	Video
3	.05	.19	48	54	47	2	
4	.18	.20	284	271	279	1, 2	Photo
5	.15	.13	29	33	31	1, 2	Photo
6 *	.40	.59	48	35	30	1	Video
6	.19	.23	134	78	79	2	
7	.03	.02	109	104	100	1, 2	Photo
All*	.24	.31	632	610	567	1	
All	.18	.22	751	689	644	2	

Notes: Study 2A and 3 were initial tests of the PLB, Study 4 assessed the level of transfer, Study 5 tested the universality of the PLB with Fijian participants, Study 6 tested whether awareness of pride displays is necessary with a priming study, Study 7 tested the efficiency of the PLB with a cognitive load study. The bottom two rows indicate the overall effect sizes of the two meta-analyses. * indicates a sample that had exclusions; all other samples did not contain exclusions. Meta-analysis 1 contained some samples that included exclusions, while meta-analysis 2 was entirely made up of samples that did not contain exclusions.

Results and Discussion

In meta-analysis 1 (which consisted of the data presented in text, excluding suspicious participants), the overall effect size of the difference in copying pride versus happy targets size was $d = .24$, which is considered significant, $p = .002$, 95% CI [.09, .39], and a small effect (Cohen, 1992). The overall effect size of the difference in copying pride versus neutral targets size was $d = .31$, which is considered significant, $p = .002$, 95% CI [.12, .50], and a small effect. In meta-analysis 2 (which consisted of the full sample, including suspicious participants), the overall effect size between pride versus happy was $d = .18$, which was significant, $p = .006$, 95% CI [.05, .31], and also a small sized effect. Another significant effect emerged between pride versus neutral, $d = .22$, $p < .000$, 95% CI [.10, .33], and is considered a small effect. These results suggest that participants are significantly more likely to copy pride-displaying social models than both happy- and neutral-displaying models, but the difference is small. This finding emerged from a total of 2084 unique participants (in meta-analysis 2) across studies, several different methods, and presenting expressions via both static photographs and videos. Meta-analyses give precision to effect size estimates (Cumming, 2012), so these results provide strong support for the existence of a small-sized PLB.

Furthermore, although guidelines for interpreting effect sizes suggest that the magnitude of the effect described here are considered small (Cohen, 1992), it is important to keep in mind that small effects are not synonymous with unimportant effects (Abelson, 1985; Prentice & Miller, 1992; Rosnow & Rosenthal, 2003). For example, when an effect can accumulate over time, small effect sizes can substantially under-represent the true effect in the real world. Abelson (1985) has effectively demonstrated this fact with a striking example: the effect of skill on baseball performance. The effect of skill in any single batting performance is surprisingly

miniscule, accounting for less than one third of one percent of the variance in performance, yet common sense would dictate that the skill of a baseball player has a large impact on overall batting performance. Although this effect is extremely small for any single at bat, it accumulates over many batting performances to eventually have noticeable real-world effects. Similarly, the PLB likely does not function as a single event, but rather accumulates over many experiences. People are likely to encounter pride-displaying targets over multiple situations and contexts, and it is over repeated exposure to pride-displaying social models where the PLB can have a large impact on behavior. Still, even in one-off situations, these results suggest that the PLB is likely to operate.

Importantly, the results of meta-analysis 2 included all participants who were excluded in results presented in the main text (i.e., suspicious participants). Concerns that these exclusions in the main text artificially boosted the PLB by removing those who did not copy the confederate can thus be ameliorated, as the meta-analysis demonstrates that the effect still emerged—and is only slightly weaker—with these suspicious subjects included. Indeed, the effect sizes varied little between meta-analyses, suggesting that removing participants in the main text did not introduce substantial bias.

Lastly, it is important to note that the pride versus happy comparisons—the weakest effects found throughout these studies—are likely to be the less accurate estimate of the real world effect. Happy targets might also be copied given the association between happy displays and longevity (see *Results and Discussion* section for Study 3). Consequently, those who display happy expressions might be copied so that the copier can gain knowledge that can lead to an increased lifespan. If this is correct, it would suggest that pride versus neutral might be a more accurate indicator of the true effect size, as neutrality might provide a more appropriate baseline

for comparison. Regardless of the "true" effect size of the PLB, even the more stringent comparison with happy is consistent with the existence of a tendency to copy those who display pride.

Overall Summary

Participants automatically associate pride displays with knowledge concepts. It seems that people cannot help but think that those who display pride are knowledgeable (Study 1). This finding is likely to influence how observers perceive those who display pride in interpersonal interactions. Indeed, participants are more likely to copy a pride-displaying confederate than a confederate displaying other emotions. Importantly, this effect only emerged when the motivation for knowledge was heightened (Studies 2A and 2B), and it was present for both static (Study 2A) and dynamic expressions (Study 3). Furthermore, when pride is displayed in a particular domain, participants seem to copy this proud individual in other domains when no new emotional information is given (Study 4). The universality of the PLB was probed by testing for it among inhabitants of a small-scale society with strict norms against displaying pride, Fijian villagers; however, the results from this study were inconclusive. Results were also inconclusive as to the automatic nature of the PLB. Although participants copied pride-displaying targets without awareness of the display, this might be due to positive valence conveyed by pride and happiness (Study 6), and it is currently unclear whether the PLB is an efficient process (Study 7). Despite these caveats, results of the meta-analyses confirm the existence of the PLB. Thus, these results suggest that pride displays are associated with knowledge and that people copy those who display pride when they are motivated to be accurate.

General Discussion

The findings presented in this dissertation add to a growing body of research on pride. First, the discovery of an automatic, uncontrollable association between pride displays and knowledge contributes to our understanding of the message(s) pride displays communicate to observers. Although previous research has found that pride displays communicate status, which likely benefits those who display pride (see *Pride and Status* section above), we now know that pride displays also communicate knowledge, which has implications for social learning and likely benefits observers (Martens et al., 2012). For example, those who can readily identify knowledgeable social models are likely to have an advantage over those who do not since they can selectively copy the "best" models. Indeed, there is considerable evidence that people prefer more knowledgeable models as sources of information (e.g., Hovland, Janis, Kelley, 1953; Koenig et al., 2004). Thus, by automatically interpreting those who display pride as knowledgeable, observers are likely to gain an advantage over those who do not. This suggests that pride displays influence observers' learning tendencies through knowledge inferences.

Second, several studies and the meta-analyses suggest that those who display pride are copied when in a heightened motivation to seek knowledge. This is likely to be a functional tendency, as those who display pride are typically successful, including areas where success is determined by knowledge possession (see *Display and Recognition* section above). Consequently, these findings add to a growing body of work on biased social learning, by pointing to an emotion expression (which is thought to have partly evolved for communicative purposes; Shariff & Tracy, 2011) that functionally influences behavioral decisions.

However, several questions remain about what inferences drive the PLB. First, it is unclear whether the PLB is driven by knowledge inferences or a more general status inference.

That is, do people copy those who display pride because they are high in status or because they are thought to possess knowledge? Pride displays are automatically and uncontrollably associated with both status and knowledge (Shariff & Tracy, 2009; Study 1), suggesting that both of these associations might play a part in the PLB. Knowledge-less status can be achieved through aggressive acts and being a more formidably sized opponent, a form of status referred to as dominance. Conversely, high-status through the possession of knowledge is termed prestige (Henrich & Gil-White, 2001). Future research should test whether those perceived high in dominance are copied to the same extent as those high in prestige. If dominant individuals are copied at a significantly lower level than prestigious individuals, it would suggest that knowledge is the more important factor. If dominant individuals are copied to the same extent as prestigious individuals, it would suggest that a more general status inference is driving the PLB. This type of future research is important in order to point to a more precise mechanism underlying the PLB.

A related question is whether those who display pride are copied simply because they appear confident and not because of a more pride-specific effect. Confidence and pride are highly related phenomenon; making it difficult to know whether confidence or pride is driving the effect. Indeed, the behavioral components associated with confidence and pride overlap (Birch et al., 2009; Cheng et al., 2014; Tracy & Robins, 2007a), and "self-confidence" is an item on the authentic pride scale (Tracy & Robins, 2007b). However, whether confidence or pride drives the PLB might largely be a definitional concern. If confidence refers to certainty in success, then it is only likely to lead to expansive nonverbal behaviors when it is in a valued domain (i.e., what Blascovich and colleagues call a "Motivated Performance Situation", 2001). For example, people can essentially be 100% certain in their ability to tell the time by looking at

their watch, but it would be highly unusual if they puffed up their chest and adopted an expansive posture when they tell others the time. Indeed, it would be odd to feel proud at this accomplishment. If, however, they were certain about a success that was valued, such as a hard earned grade on an exam, they would be much more likely to show pride (Tracy & Robins, 2007c; Weisfeld & Beresford, 1982). This suggests that the nonverbal behaviors often associated with confidence might actually be the nonverbal behaviors of pride. This is an intriguing possibility, but current evidence does not support firm conclusions one way or the other. Clearly, more research is needed to tease apart the exact mechanism that drives the PLB, whether it be confidence, status, knowledge, or a combination of these and other factors.

Another topic worth considering relates to the extent to which copying is related to learning. Copying was measured in the PLB studies to assess whether learning was affected by pride displays. Copying, however, does not always reflect learning (Over & Carpenter, 2012). Copying might occur for a variety of reasons, such as a desire to fit in with others (e.g., Asch, 1956), for group cohesion (e.g., Chartrand & Bargh, 1999), or to gain information (e.g., Sherif, 1935). Although learning retention (i.e., whether participants internalized the knowledge) was not assessed, we can be reasonably confident that informational concerns were likely responsible for the PLB, given that participants' motivation for correct responses was heightened. Indeed, when this motivation was not heightened in Study 2B, copying proud targets decreased. This thinking is consistent with the thinking underlying McClelland's need theory (1961), where motives are thought to facilitate *relevant* learning that satisfies a particular heightened motive. For example, on a picture-word pairs learning task (where participants had to learn the associated word for each picture) that had power-related and non-power-related stimuli, those high in need for power (i.e., a desire to have influence over others) learned power-related stimuli faster than

non-power-related stimuli (McClelland, Davidson, Saron, & Floor, 1980). When it comes to pride displays, this reasoning suggests that when social learning motives are active, informational copying (e.g., the PLB) and learning is likely to occur. Furthermore, the motive for social learning is likely to compete with other motivational states in the real world, such as basic instincts like thirst or hunger, as well as other motivations such as a desire to be consistent (Festinger, 1957) or a need for power (McClelland, 1961). That is, people's motivation to be accurate is not always likely to be the dominant one, so social learning might not always take place, despite its advantages.

This reasoning brings into question how various motives interact and influence the PLB. This is an empirical question; however, if the PLB is automatic (discussed in more detail below), then certain predictions can be made. I will limit my focus to two motives that are likely to influence learning: the need to achieve, and the need for cognition. The need to achieve is a strong desire for accomplishments (McClelland, 1961), whereas the need for cognition represents a desire or enjoyment for effortful thinking (Cacioppo & Petty, 1982). Both of these motives are associated with increased learning (Lowell, 1952; Sadowski & Gülgös, 1996), which might superficially suggest that those high in either of these needs would be more likely to use a learning bias. However, this likely is not the case. Those high in need for achievement show more involvement in accomplishing their goals than those low in need for achievement (Steers, 1975). In other words, they work hard in order to achieve. The PLB requires little effort to occur (i.e., copying is easy—indeed, this is one of the strengths of using biases), suggesting that increased effort might potentially override the bias. Consequently, those high in need for achievement are not predicted to use the PLB when this motive is active. Similarly, those high in a need for cognition are less likely to use heuristics or rely on others, such as experts, when

making decisions since they enjoy effortful thinking (Cacioppo, Petty, Feinstein, & Jarvis, 1996), suggesting that these individuals are unlikely to use the PLB when the need for cognition is active. Thus, other motives are likely to compete and influence the extent to which the PLB is evident.

The discussion in the preceding paragraph assumes that the PLB is automatic. However, results from the dissertation were not consistent with this expectation. For example, although Study 6 found that an awareness of pride displays was not necessary to influence copying, this effect was not substantially different from the effect of happy displays, and might represent an automatic valence effect instead of a pride effect. It is important to remember, however, that automaticity is multifaceted (Bargh, 1994; Evans, 2008; Payne, 2012). For example, an effect can occur without awareness, be efficient, or occur unintentionally without control. A failure to find evidence for one type of automaticity does not imply that *all* types of automaticity are absent. Indeed, to be considered automatic, a process need only satisfy one of these categories. Consequently, conclusions that the PLB is not automatic might be premature. In addition, the pattern of results in Study 6 (which tested whether awareness of pride displays is necessary for the PLB to emerge) were such that, although pride primes were significantly different from neutral primes, happy primes were not significantly different from either neutral or pride primes, making it unclear as to whether the effect of pride primes is due to positive valence. Future research is needed to clarify the situation, but currently, it is clear that pride primes do affect copying, without awareness, more than neutral primes. Study 7, the efficiency study, also failed to find evidence of automaticity; however, it also failed to find evidence of the PLB, likely due to an insufficient incentive. Consequently, it is currently unclear as to whether the PLB is efficient. As discussed in detail in the *Cognitive Underpinnings of the Pride Learning Bias*

section above, there are several reasons to believe that pride displays work through automatic processes (e.g., an automatic PLB is consistent with dual-process models, research on automatic person perception and how emotion expressions tend to work through automatic routes, and would take advantage of fleeting expressions and save cognitive resources), so this remains an important area for future research, which should test for each aspect of automaticity separately.

However, it is also possible that the PLB is *not* an automatic process. If this were the case, it might suggest that participants who demonstrated the PLB did so because of a conscious decision. This would imply that cognitive resources are necessary for the PLB to emerge and that the PLB only works in situations where more effortful cognitive processing is possible. For example, we would not expect to see the PLB when individuals are under high levels of stress or while distracted. If this is true, it would suggest that the PLB might be a less robust bias than otherwise thought.

Another important question raised by these findings is how fake and honest pride displays influence copying. In all of the studies of the dissertation, pride displays were not honest signals of knowledge (all of the social models were actors and answered incorrectly). Given that those who display pride are likely to acquire adaptive advantages (e.g., status and influence over others), it would be beneficial to be able to fake pride. However, if this type of false signaling occurred frequently in our evolutionary history, the signal would lose its meaning and no longer function, so it is likely that pride displays have been (and are) shown honestly, on average. To decrease the extent to which pride is faked, cultural norms and reputational costs likely exist (see Martens et al., 2012). For instance, those who display undeserved pride might be perceived as arrogant instead of knowledgeable. Arrogance is an undesirable trait that has negative reputational costs. Such costs would decrease the likelihood of faking as costs tend to make a

signal reliable (Zahavi, 1975). That is, as the cost of faking increases, the likelihood of faking decreases. This reasoning suggests that pride displays tend to be generally honest in the real world, which is consistent with past research that has found that those who succeed display pride to a greater extent than those who do not succeed (e.g., Tracy & Matsumoto, 2008). Thus, although pride displays were faked in these studies, they are likely to be honest and functional signals in the real world.

The above description suggests that pride displays might be an evolved honest signal and that the PLB might function universally. However, results with Fijian participants were inconclusive as to the universality of the PLB. If future research with Fijian participants finds that the PLB is a human universal, it would be consistent with the PLB being an evolved tendency. Indeed, cultural learning models suggest that prestige—status earned through the possession of valuable skills or knowledge—evolved, partly, to inform onlookers of who valuable targets are in order to learn from them (Henrich & Gil-White, 2001). Conversely, if the PLB is instead found to be a culture-specific strategy, that would suggest that pride displays have differential effects on observers depending on their cultural upbringing, which would then raise questions about what function pride displays have for observers in societies such as Fiji. One possibility is that, since Fijians make automatic status inferences from pride displays (Tracy et al., 2013), they might use pride displays in a more dominance-based, as opposed to prestige-based, manner. More specifically, because displaying pride is not normative in this population, they may infer dominance (which is associated with arrogance and hubris; Cheng et al., 2010) instead of prestige from such displays. If true, this would suggest that Fijian observers would copy pride-displaying individuals out of fear of a dominant individual or a desire to fit in, but not for social learning reasons, as dominant individuals are less likely to possess valuable knowledge

than prestigious models. On the other hand, Westerners likely infer prestige from the prototypical pride expression. The behavioral components of the prototypical pride expression, such as an expanded chest, torso pushed out, a slight head tilt, and a small smile, have been found to lead to prestige judgments in face-to-face interactions (Cheng et al., 2014). Since pride displays are primarily normative in Western society (at least in certain contexts), prestige inferences of pride displays are likely among Westerners. Another reason to expect different interpretations of pride displays between Fijians and Canadians has to do with relational mobility (i.e., where relationships form by choice; Schub, Yuki, & Maddux, 2010). In societies that are high in relational mobility, such as Canada, advertising prestige is likely more common, as prestige is granted by choice. Advertising status that is freely granted might be less of a concern in societies like Fiji where status is ascribed, not chosen. This might result in disproportionately more inferences of prestige among Western samples.

A final note worth mentioning before proceeding is that throughout this dissertation I have argued that the PLB is likely an evolved adaptation. However, it is important to note that the tendency to copy those who display pride might not be an adaptation at all. It is also possible that the tendency to copy those who display pride is simply learned rather than innate. Although my theoretical approach suggests that the PLB is evolved, the evidence currently does not show strong support for this account. Future research will be needed to test whether the PLB is indeed an adaptation.

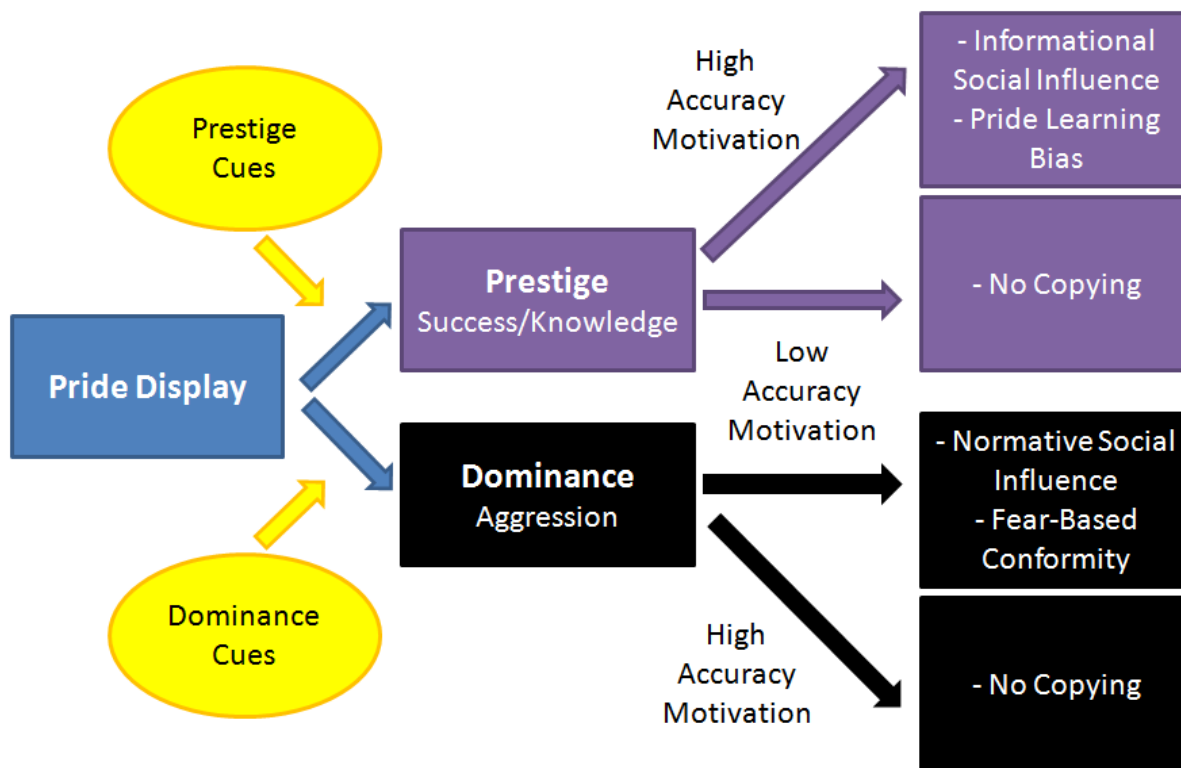
In the next section, I incorporate several findings and present an informal model—the Pride Learning Model—which suggests new avenues for research. This model remains largely untested, but it provides a rough framework that can guide future research. I then end the

dissertation with a discussion of some limitations of the research and suggest some future directions, as well as give some brief concluding remarks.

The Pride Learning Model

Figure 10 depicts the Pride Learning Model. It delineates the conditions under which pride displays are expected to lead to copying behavior. First, when a pride display is observed, others interpret the target as high in status. This reasoning follows directly from the work reviewed earlier showing that pride displays are automatically associated with high status (see section *Pride and Status*). However, research on human status hierarchies suggests that there are two fundamental types of high status: prestige and dominance (see Cheng & Tracy, in press). Prestige is high status that is freely granted from group members, which results from the possession of valuable skills or knowledge, while dominance is high status that is gained through the use of aggression and intimidation (Henrich & Gil-White, 2001). Whether those displaying pride are perceived as prestigious or dominant will likely depend on available contextual information (Cheng, Tracy, & Henrich, 2010; Tracy & Prehn, 2012).

Figure 10. The theoretical Pride Learning Model



Notes: A pride display may lead to either prestige or dominance interpretations, which will be influenced by their respective cues. A pride display primarily interpreted as prestige will lead to informational social influence and the Pride Learning Bias when motivation for accuracy is high. Whereas a pride display primarily interpreted as dominance will lead to normative social influence and fear-based conformity when motivation for accuracy is low.

Various cues of prestige and dominance are expected to influence how pride displays are interpreted. For example, research on the spontaneous displays that occur in face-to-face encounters has found that the behavioral components of the pride expression thought to signal confidence, such as an expanded chest, torso pushed out, a slight head tilt, and a small smile, lead to prestige judgments, while spatially expansive movements such as having the arms out

from the body, having a wide/expansive posture, and occupying space with the body, lead to dominance judgments (Cheng et al., 2014). Behavioral components that make up the prototypical pride expression are present in both of these displays (see section *Display and Recognition*). Consequently, whether prestige or dominance is inferred from pride displays will partly depend on which behavioral components of pride are displayed. Given that all four of the behavioral components associated with prestige would be considered components of the prototypical pride expression (i.e., an expanded chest, torso pushed out, a slight head tilt, and a small smile), and only one of the three behavioral components of dominance would be (i.e., arms out from body can be consistent with arms raised or akimbo), when people see the prototypical pride expression, in the absence of other contextual information and when pride displays are normative, prestigious judgments are likely.

Another factor that influences how pride displays are interpreted is context. For example, when those who display pride attribute their success to effort, authentic pride (characterized as feelings of confidence, self-worth, and productivity) judgments are likely, whereas when they attribute their success to ability, hubristic pride (characterized as feelings of arrogance and hubris; Tracy & Robins, 2007b) judgments are more likely (Tracy & Prehn, 2012). In related work, using both self- and peer-reports, participants' level of authentic pride is positively correlated to their level of prestige, while hubristic pride is positively correlated to their level of dominance (Cheng et al., 2010). Together, these findings suggest that those who experience effortful success and confidence will lead to prestige judgments, while those claiming success through ability and display arrogance will lead to dominance interpretations. This part of the model is primarily theoretical, so no published studies have directly looked whether pride displays lead to prestige and/or dominance inferences.

When pride-displaying targets are interpreted as prestigious, pride displays will lead to copying when the motivation to seek accurate knowledge is high. That is, prestigious individuals are likely to be the experts of a group, so copying them is beneficial when learning accurate information is the observer's primary motive. This part of the model is consistent with research on informational social influence, which demonstrates how participants are more likely to copy a supposedly more knowledgeable social model when they need knowledge, but lack the correct knowledge themselves (i.e., when the motivation for social learning is high; e.g., Cialdini & Goldstein, 2004). In addition, by deferring to (and learning from) prestigious models, lower-status individuals may gain access to further learning opportunities from those group members who have superior skills and knowledge (Henrich & Gil-White, 2001; Martens et al., 2012), which suggests that copying prestigious models is likely to occur when a desire to learn is heightened. This part of the model is consistent with Studies 2A and 2B, which found that only when in a heightened motivation to learn, does the PLB emerge.

In contrast, when pride displays advertise who is dominant, being in a heightened motivation to seek knowledge should not increase copying. This is because dominant individuals do not necessarily possess relevant skills or knowledge. Rather, their high status is based on the induction of fear and aggression, so observers are more likely to use their own knowledge base (when in a heightened motivation to seek knowledge) than to rely on the dominant target. This prediction is consistent with research on informational social influence discussed above, where people select more knowledgeable social models than themselves. Copying dominant individuals is likely to occur, however, when normative concerns or a fear of a more dominant target is high and the motivation for accuracy is low. This aspect of the model is consistent with normative social influence studies that show how participants are more likely to show public compliance,

but not private acceptance, when normative concerns are heightened (e.g., Cialdini, Reno, & Kallgreen, 1990); this form of copying may be driven by a desire to fit in and not out of a desire for accurate information (Asch, 1956).

In the studies I presented in the dissertation, I primarily tested the upper right hand portion of the model depicted in Figure 10. That is, whether those who display pride are copied when observers' motivation for accuracy is heightened, and whether this tendency to copy pride-displaying targets decreases when this motivation for accuracy decreases. Support was found for this aspect of the model. One benefit of this model, however, is that it suggests some new avenues of research. For example, pride displays can lead to copying for two very different reasons, which have different implications. Copying dominant social models should be based on public compliance, but not private acceptance; whereas copying prestigious models should be based on private acceptance (i.e., internalizing the knowledge). Future research could manipulate dominance, prestige, and normative and informational motivations to explore whether these parts of the model are supported. If support is found for the model, it would suggest differential ways that observers use the nonverbal pride expression: one for knowledge, the other to fit in.

Limitations and Future Directions

There are several limitations of the studies of the dissertation that warrant discussion. First, the IAT study (Study 1) compared knowledge words with ignorance words. Although it is standard practice to select concepts that are theoretical opposites when designing IAT studies (e.g., pleasant versus unpleasant; Greenwald et al., 1998) this choice means that results might have been due to a stronger negative association between pride displays and ignorance than to a positive association between pride displays and knowledge. Although knowledge and ignorance can be viewed as opposite ends of a continuum, suggesting that pride displays should be both

positively associated with knowledge and negatively associated with ignorance, the exact nature of this association should be addressed in future research by drawing on comparison categories that are unrelated to knowledge (if compared with knowledge concepts) or unrelated to ignorance (if compared with ignorance concepts). Doing so will give a more nuanced understanding of how pride displays are interpreted.

A further limitation of Study 1 is that participants saw decontextualized, prototypical pride expressions. This research choice ensured that internal validity remained high, but it remains unclear whether these effects will emerge when also given contextual cues (e.g., whether a success occurred or not) or when less prototypical expressions are displayed. Given the large effect sizes that emerged in the various versions of the study, it could be the case that less prototypical displays only diminish the association, rather than completely eliminate it, but future research should test whether this is the case by using a variety of real world stimuli and adding context to pride displays (see Shariff et al., 2012 for an example of how to add context to IATs). Conducting these types of studies will give a better sense of how pride displays are interpreted in the real world.

Similarly, several other studies (Studies 2A, 2B, 4, 5, and 7) employed prototypical, static photos as stimuli, which are not realistic of how pride is dynamically (and less prototypically) displayed in the real world. As with Study 1, this was done to ensure that internal validity remained high, but it also means that conclusions from these studies are limited to prototypical displays. However, this is less of a concern given the replication using video stimuli (Study 3) that had actors dynamically convey the intended emotions. Although the manipulation check confirmed that the actors in these videos portrayed the intended emotions, they too were not genuine (i.e., confederates were acting). There might be subtle differences in real versus fake

displays (for an example with smiles, see Ekman & Friesen, 1982), which might affect results. Importantly, this should work against finding an effect, given that those who fake displays are less likely to be trusted. Still, future research should use genuine expressions as stimuli to gain a better sense of how the PLB might function in the real world.

A more serious issue occurred with the video studies (Studies 3 and 6), where a large proportion of participants were removed due to suspicion, suggesting that the videos (or other aspects of the study) were not believed. Although the pattern of results was the same when suspicious participants were included (i.e., pride targets were copied the most—though not significantly more so than happy targets in both studies, or neutral targets in Study 3, but marginally more than shame-displaying targets in Study 3; see Appendices A and B), this is a serious limitation, as removing such a large proportion of participants introduces potential confounds. One likely possibility is that suspicious participants are less likely to copy social models, so by removing them, effects are exaggerated or possibly spurious in the retained sample. Indeed, in Study 3, suspicion was negatively related to copying, but only within the pride condition (see Appendix A). This result may be due to a tendency to distrust individuals who show pride without evidence of a success, among observers who are using more deliberative processing (which is indicated by their higher level of suspicion). Importantly, this correlation implies that, because suspicion would reduce the size of predicted effects, findings supporting the hypothesis that emerged in the retained sample would underestimate the true effect size if retained participants were suspicious but did not report it. When viewed in isolation, the results of either of these studies should be interpreted with caution; however, the meta-analysis that included all suspicious participants found support for the hypothesis, which adds confidence to the PLB being a real phenomenon. Given the pattern of responses in the full sample and the

results of the meta-analysis, concerns about exclusions due to suspicion should be diminished. Future research, however, should avoid such suspicious methods and instead use dynamic expressions in a more believable context, such as videos of real, spontaneous expressions (i.e., not displayed by actors).

Another limitation is that all participants in Studies 2A and 3 through 7 were motivated for accuracy with a financial incentive. Financial incentives have been used in social learning research to heighten participants' social learning motivation, but since other means of increasing motivation were not used, it leaves open the possibility that responses are unique to being motivated for money, and not necessarily for social learning. However, these studies likely temporarily heightened this motive, but for external reasons (i.e., money). That is, the financial incentive likely increased participants' motivation for accuracy, as accurate responses would have led to their financial reward. Still, to ensure that the effects are not specific to money incentives, future research should increase social learning motivation in other ways, such as attaching weight to tasks through other desirable qualities (e.g., tasks for students that will seemingly affect their grades, or sports-related tasks for athletes).

A limitation specific to the level of transfer study (Study 4), which tested the extent to which those who display pride are later copied in various domains (and no emotion is displayed), is that only one domain was used as the initial domain where pride was displayed (i.e., math). This leaves open the possibility that the PLB only transfers to other domains when math is involved. It could be the case that math knowledge is particularly well-suited for generalizing; however, the fact that math does not seem relevant for sports knowledge makes this possibility less likely. Nevertheless, all the domains were similar in that they were trivia-based knowledge (i.e., they were each presented as a trivia question), which brings into question whether copying

would have transferred to non-trivia-based knowledge. Furthermore, although there was no interaction between emotion and domain (suggesting a trait-like effect), the exploratory analyses suggested that the PLB is weaker in more distantly related domains (a more state-like effect). To address this issue, future research should assess copying in a variety of different ways, such as copying behavioral patterns (i.e., body movements required to accomplish a goal).

In addition, domains likely exist that contain information that is incongruent with each other, and it seems unlikely that incongruent domains will show transfer of the PLB. For example, it seems less likely that someone will copy a devout protestant who displayed pride while giving a class presentation on creationism, on a biology test on Darwinian evolution, than to rely on their own knowledge. Future research should address this issue by employing multiple domains, some that are incongruent and others that congruent with each other.

A final limitation involves the universality study that recruited Fijian participants (Study 5). Here, research assistants placed a rock on the flag to indicate the confederate's response. This was done so that participants would have a visual reminder of the confederate's answer to which they could easily refer. However, this might have also indicated that the answer was "taken" by the confederate, and participants might have avoided copying the confederate as a result.

Although participants were told that they could select any answer, the visual reminder might have been enough to sway responses. Future research should avoid such a design by indicating the confederate's response in a less intrusive way (e.g., by clearly pointing at the flag to indicate the confederate's response).

Concluding Remarks

When we encounter someone displaying pride, we cannot help but think he/she is knowledgeable, and we copy them when social learning motives are high. There is much still to learn about these effects, but the dissertation provides the initial studies that assess these aspects of this important emotion display, which can be built on by future research.

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Appendices

Appendix A: Results Including Participants who Demonstrated Suspicion

The following analyses were conducted with the entire sample of Study 3 ($N = 199$).

Manipulation Check. Pride-displaying confederates were judged as showing significantly greater authentic and hubristic pride ($M_s = 5.24$ and 3.94 , respectively) than happy-, shame-, and neutral-displaying confederates (authentic pride $M_s = 4.40, 1.73$, and 3.80 ; $t(100) = 3.21, t(96) = 17.29, t(93) = 5.44$, respectively; hubristic pride $M_s = 2.18, 1.16$, and 2.18 ; $t(100) = 5.79, t(96) = 11.24$, and $t(93) = 5.55$, respectively), $ps < .05$. Similarly, shame-displaying confederates were judged to show significantly greater shame ($M = 3.02$) than happy-, proud-, and neutral-displaying confederates ($M_s = 1.56, 1.38$, and 1.47 ; $t(102) = 4.52, t(96) = 5.28$, and $t(95) = 5.04$, respectively), $ps < .05$; and happy-displaying confederates were judged to show significantly greater happiness ($M = 5.43$) than pride-, shame-, and neutral-displaying confederates ($M_s = 4.48, 1.50$, and 3.23 ; $t(100) = 2.93, t(102) = 15.51$, and $t(99) = 6.92$), $ps < .05$.

Does the Pride Expression Promote Copying? I conducted a one-way ANOVA to test the effect of emotion expression on copying behavior (and also replicated all analyses using non-parametric statistics). With this full sample of participants, including those who reported suspicion regarding some aspect of the study design, emotion expression did not significantly affect copying frequency, $F(3, 194) = 1.21, p = .31, \chi^2(3) = 3.63, p = .31$. Pride-displaying confederates were not copied significantly more than happy (56% versus 54%, $t(100) = .26$, Cohen's $d = .05, p = .80, \chi^2(1) = .07, p = .80$); or neutral (47%, $t(93) = .92$, Cohen's $d = .19, p = .36, \chi^2(1) = .85, p = .36$); but were copied marginally more than shame-displaying confederates (39%, $t(95) = 1.73$, Cohen's $d = .35, p = .09, \chi^2(1) = 2.97, p = .09$). None of the other

frequencies differed significantly from each other. Based on binomial tests, all emotion-displaying confederates were copied significantly more frequently than would be expected by chance (20%), p s = .000, .000, and .000 for pride, happy, and neutral conditions, respectively.

Thus, the full sample of participants (including suspicious participants) in the results revealed a similar pattern to that reported in text, with pride leading to most copying, followed by happy, neutral, and shame, but these differences did not reach significance, due to the fact that, although there was no overall effect of suspicion (as measured by the number of items participants indicated suspicion on) on copying, $r = -.01$, $p = .90$, there was a negative effect within the pride condition only, $r = -.34$, $p = .02$, suggesting that the more suspicious participants were, the less likely they were to copy proud confederates (r s = $-.01$, $.22$, and $.09$, p s = $.96$, $.14$, and $.55$ for happy, neutral, shame conditions, respectively). This may be due to a tendency to distrust individuals who show pride without evidence of a success, among observers who are using more deliberative processing (which would also make them more suspicious). Importantly, this correlation implies that, because suspicion would reduce the size of predicted effects, findings supporting my hypotheses that emerged in the retained sample would underestimate the true effect size if retained participants were suspicious but did not report it.

Appendix B: Results Including Participants who Demonstrated Suspicion

Using the full sample in Study 6 ($N = 291$), I conducted a one-way ANOVA to test the effect of emotion expression prime on copying behavior (and also replicated all analyses using non-parametric statistics). With this full sample of participants, including those who reported suspicion regarding some aspect of the study design, emotion expression prime did not significantly affect copying frequency, $F(2, 288) = 1.76, p = .17, \chi^2(2) = 3.52, p = .17$. Pride-displaying confederate primes did not affect copying significantly more than happy-displaying confederate primes (61% vs. 51%, $t(210) = 1.41, \text{Cohen's } d = .19, p = .16, \chi^2(1) = 1.98, p = .16$); but were copied marginally more than neutral-displaying confederate primes (49%, $t(211) = 1.69, \text{Cohen's } d = .23, p = .09, \chi^2(1) = 2.83, p = .09$). None of the other frequencies differed significantly from each other. Based on binomial tests, all emotion-displaying confederates were copied significantly more frequently than would be expected by chance (20%), $ps < .05$.