

Advances in
EXPERIMENTAL SOCIAL PSYCHOLOGY

VOLUME 41





VOLUME FORTY ONE

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ADVANCES IN EXPERIMENTAL SOCIAL PSYCHOLOGY

EDITED BY

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THE INTROSPECTION ILLUSION

Emily Pronin

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Abstract

Introspection involves looking inward into conscious thoughts, feelings, motives, and intentions. Modern social psychological research has raised questions about the value and reliability of information gained via introspection. This chapter concerns people's heavy weighting of introspective information for making self-assessments. It also concerns a few principles associated with that weighting—that is, that it does not extend to how people treat others' introspections, that it can lead people to disregard information conveyed by their own (but not others') behavior, and that it is rooted not only in people's unique access to their introspections but also in the unique value they place on them. Over-valuing of personal introspections occurs in a variety of domains, including judgment and decision making, personal relationships, and stereotyping and prejudice. An understanding of it sheds light on theoretical concerns involving the actor–observer bias, self-enhancement, temporal distance effects, and the perception of free will. People's unique valuing of their introspections likely has deep roots, but this “introspection illusion” also causes problems. It can foster conflict, discrimination, lapses in ethics, and barriers to self-knowledge and social intimacy. Understanding its sources and effects may help alleviate some of those problems.

1. INTRODUCTION

“I think therefore I am.” In 1637, the most well-known line in the history of modern philosophy was written. Descartes' claim derived from a basic intuition: If there was one thing in which he could be confident, it was the reality of his own thoughts. Indeed, the capacity for conscious introspection is fundamental to human experience and is commonly thought to differentiate humans from other animals. Through introspection, people constantly are aware of the various thoughts, feelings, and motives that reside in their conscious minds.

However, important advances in cognitive and social psychology have questioned the degree to which introspection can uncover the sources of our judgments and actions. People, it has been shown, can form impressions of others, pursue goals, adopt attitudes, and regulate their emotions—all without awareness, effort, or intent (e.g., Hassin et al., 2005; Wegner & Bargh, 1998). People's introspective access to their conscious intentions, emotions, prescient thoughts, and salient attitudes all can mislead them in

their efforts at self-understanding (respectively, Epley & Dunning, 2000; Gilbert et al., 1998; Pronin et al., 2006b; Wilson et al., 1993). In short, introspection often is not a valid and reliable method for assessing the self.

Nevertheless, people show a persistent and widespread tendency to place heavy weight on introspection when seeking self-understanding. I refer to this tendency as an *introspection illusion*. The “introspection” part refers to information gained by looking inward, however briefly, to thoughts, feelings, motives, intentions, and other mental contents. The “illusion” part refers to some mistaken notions that people have about introspective information and its value.

Given the sometimes weak value of introspection, why do people place so much value on the information they obtain from it? In a classic study, college students watched a video interview with a university instructor who had an unfamiliar foreign accent. In one version of the video, his responses were warm and likable; in the other, they were cold and unlikable. Students who saw the warm and likable version later rated the instructor’s accent as more pleasant than did those who saw the other version. However, they were unaware that his likability influenced how they perceived his accent and even confidently claimed that the reverse had occurred—that his accent made them like (or dislike) him. This experiment by Nisbett and Wilson (1977a) demonstrates something more than the unreliability of introspection. It also suggests people’s false confidence in its reliability.

One reason for that confidence likely involves the wealth of introspective information available to people. When individuals are inundated with information about their thoughts, feelings, and intentions, they may naturally come to view those introspections as an *authentic* source of self-knowledge (Wilson, 2002). Another important reason for people’s confidence in their introspections likely involves the felt directness of introspective information. William James described people’s experience of their thoughts as having “a warmth and intimacy about them of which [others’] are completely devoid” (James, 1890, p. 314). This fact may lead people to value their own introspections more than those of other people because, of course, people cannot experience others’ thoughts and feelings with the same directness, warmth, and intimacy. Even when one is privileged enough to have access to others’ introspections, such as when those others share their thoughts about a particular judgment, that access is of an indirect sort. Consequently, one may value it less (e.g., “I know you think his cold personality didn’t affect your perception of him, but I have to weigh that against how harsh you were about his accent.”).

1.1. Self and other

In the case of others, what individuals seem to experience more directly than introspective information is *extrospective information*—that is, information gained by looking outward to behavior rather than inward to thoughts

and feelings (Pronin, 2008a). People generally cannot directly perceive their own appearance and actions, and this distinction in visual attention has been shown to influence the attributions people make (Storms, 1973; Taylor & Fiske, 1975). Given the confidence people place in information that arrives at them “directly” (Ross & Ward, 1996), it seems that people may not only differentially attend to introspective versus extrospective information about themselves versus others, but they also may differentially value those sources of information when considering themselves versus others.

In proposing such an asymmetry, this theorizing offers a new chapter to social psychology’s unfinished story about the divergent perspectives of actors and observers. Even unfinished, that story has earned the status of a classic—owing in large part to a set of theoretical accounts proposed nearly 40 years ago by Jones and Nisbett (1972) and Bem (1972), with further elaboration by Nisbett and Wilson (1977b). These sometimes seemingly contradictory accounts differ both in the emphasis they place on introspective awareness and in the introspective material they consider. Jones and Nisbett generally were interested in circumstances in which actors have “more, and more precise” introspective information about their internal states than do observers (p. 85). In that context, they theorized about actors’ inclination to form different causal explanations from observers. Bem and also Nisbett and Wilson were interested in circumstances in which actors lack privileged introspective access to mental process. In that context, they emphasized actors’ tendency to rely on the *same* information and to reach the same conclusions as observers.

The current theorizing speaks to circumstances in which actors have rich access to introspective information, such as when introspection provides actors with convincing evidence of their good intentions. Importantly, though, it also speaks to circumstances in which actors lack introspective access, such as when introspection fails to reveal to actors the influence of bias on their own judgments because that bias operates automatically and does not leave conscious traces. In both cases, the introspection illusion involves actors’ placing too much weight on introspection. In the former case, actors place that weight on whatever information is *present* in introspection (e.g., on their good intentions); in the latter case, they place it on the *absence* of information in introspection (e.g., on their absence of feeling a motive to be biased). In both cases, people view the contents of introspection as highly meaningful, but in the former that meaning is derived from what introspection yields and in the latter from what it fails to yield.

1.2. Components of the illusion

The introspection illusion, in essence, involves people’s treatment of their introspections as a sovereign (or, at least, uniquely valuable) source of information about themselves. People tend not to show this heavy *introspective*

weighting when considering the introspections of others. Therefore, another component of the introspection illusion involves a *self–other asymmetry*. Placing so much weight on one’s introspections engenders, by necessity, a sort of *behavioral disregard* whereby people give less consideration to their behavior (but not the behavior of others). A final component of the introspection illusion is that it does not arise purely from the fact that, in general, actors have introspective access whereas observers do not; it also arises from actors’ and observers’ *differential valuation* of information derived from actors’ introspections. The introspection illusion thus has four components, with the first being most defining:

- 1. *Introspective weighting* (heavy weighting of introspections when assessing self)
- 2. *Self–other asymmetry* (absence of above when assessing others)
- 3. *Behavioral disregard* (disregard of behavior when assessing self but not others)
- 4. *Differential valuation* (asymmetric valuation of own versus others’ introspections)

The components of the introspection illusion derive in large part from the nature of how people perceive themselves and others, and in particular from the information that feels directly available to people when engaging in the perception of self and others. Fig. 1.1 illustrates the distinction between people’s seemingly direct experience of introspective information

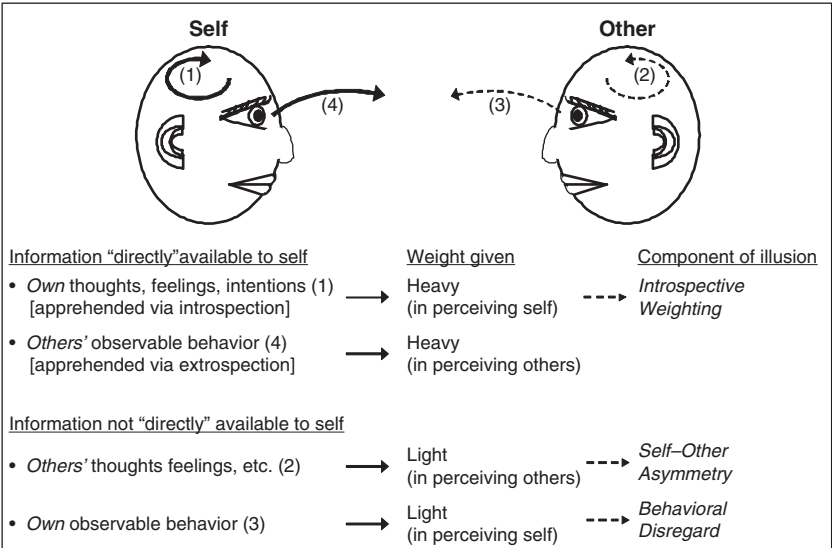


Figure 1.1 A graphical illustration of the perceptual basis of the introspection illusion.

about themselves, versus their seemingly direct experience of extrospective information about others. Illusions involve the fallibility of seemingly direct perception. The introspection illusion derives its name from the fact that it involves this fallibility in the case of one particular kind of perception—that is, not perception of external phenomena (as in the typical case, such as with optical illusions) but rather perception of internal phenomena. John Locke (1690/1975) described introspection as an internal rather than external form of perception, stating that “though it be not Sense, as having nothing to do with external Objects; yet it is very like it, and might properly enough be call’d internal sense.” Much as people seem to wholly trust information that comes to them via external sensory perception, people also seem to wholly trust information that comes to them via introspection. And, much as external perception can deceive, so too can introspection. That deception can involve both what *is* perceived and also what is *not* perceived (as when the presence of bias is not perceived because it has operated automatically). The term introspection *illusion* is intended to reflect not only people’s illusory notions about introspection (notions that lead them to overweight and overvalue their introspections) but also this basic perceptual source of people’s overweighting and overvaluing of introspection.

This chapter first reviews evidence aimed at explicitly identifying the introspection illusion. That evidence comes from research showing that people’s blindness to their own bias results from their heavily weighting introspection to detect something that occurs unconsciously. The chapter then offers evidence that the introspection illusion gives rise to a large number of important phenomena across major domains of social psychology, ranging from judgment and decision making to stereotyping and prejudice. Next described are contributions of the introspection illusion framework to theorizing about the actor–observer bias, self-enhancement tendency, effects of psychological distance, and belief in free will. Finally, roots of the illusion are discussed, as are its applications to problems concerning conflict, the persistence of racism and sexism, lapses of ethics, and the pursuit of self-knowledge and social intimacy.



2. IDENTIFYING THE ILLUSION: THE CASE OF BIAS

Although the rudiments of the introspection illusion are suggested by many important findings in social psychology, the identification of it is new. It first was identified as a mechanism underlying people’s *bias blind spot*, or relative blindness to their own versus others’ bias (Pronin et al., 2004). The most direct evidence for the illusion comes from research on that blind spot.

People tend to deny their own susceptibility to bias, even while they readily impute (and even exaggerate) others’ susceptibility (Pronin, 2007).

This occurs for a variety of biases, such as the biasing effects of: self-interest in forming attitudes about policy issues (Miller & Ratner, 1998), personal affections in judging who is at fault in an interpersonal conflict (Frantz, 2006), ignoring the situation in explaining others' behavior (Van Boven et al., 2003b), political ideology in assessing policy issues (Robinson et al., 1995), and irrelevant numeric anchors in making numeric estimates (Wilson et al., 1996). The bias blind spot may at first seem like pure self-enhancement. After all, biases are generally viewed as undesirable. However, a deeper exploration points to the underlying role of the introspection illusion. That evidence is now reviewed, with the goal of using it to illustrate the four components of the introspection illusion.

2.1. Introspective weighting

The first component of the introspection illusion involves giving heavy weight to introspections in self-assessment. Heavy weighting of introspective information about intentions, motives, and wishes logically could account for people's bias blindness, because the operation of bias often eludes introspective awareness (Banaji & Greenwald, 1995; Dawson et al., 2002; Ditto & Lopez, 1992; Kahneman, 2003; Lieberman et al., 2001; Wilson et al., 2002). In such cases, when bias is nonconscious, introspection will mask bias and even may turn up false signs of objectivity if one has consciously tried to be objective.

When people erroneously judge their own driving ability to be better-than-average, or when they egocentrically take too much credit for collaborative projects, they often show these biases without knowing it. The introspective weighting component of the introspection illusion suggests that people will show a blind spot for biases that operate nonconsciously and thereby elude introspective awareness. For biases that leave signs in introspective awareness, by contrast, people should not claim relative insusceptibility. In order to test that prediction, Pronin et al. (2002) asked San Francisco airport travelers to rate their susceptibility to various biases in human judgment compared with the susceptibility of others traveling at the airport that day. The biases included things such as taking credit for one's successes while denying responsibility for one's failures (*self-serving bias*) and making overly dispositional inferences about the reasons for others' outcomes in life (*fundamental attribution error*). Importantly, respondents also were asked about a few biases that are likely to leave signs in conscious awareness. For example, they were asked about their tendency in times of hardship to selectively compare themselves to those who are worse off, which is a bias that our research suggested individuals often have a nagging awareness of at the time they are showing it. The result was that respondents showed a blind spot for biases that are unconscious

(i.e., most biases), but their blind spot disappeared in the case of biases that leave introspective traces.

Pronin et al. (2009) tested the introspective weighting component of the introspection illusion by experimentally manipulating actors' introspective cues to bias. Participants in the experiment were students at an elite-admissions American university. They read about a new policy that their school allegedly was considering to limit over-representation of students from the northeastern United States. The policy involved deducting 20% from the score assigned to any application from a Northeast high schooler. The students indicated whether they supported or opposed the policy, and how objective or biased they felt they were in evaluating the policy. They also rated their affect. Most students (91%) opposed the policy, and that opposition did not differ based on whether they were from the Northeast. We expected that Northeasterners, though, would feel more biased in evaluating the policy than would their peers because Northeasterners would have an introspective cue of bias—that is, a negative emotional reaction when reading about the policy. We tested this hypothesis using a misattribution design. All participants received their study materials, including the description of the admissions policy, on purple paper. The experimenter explained that this was because she “ran out” of plain paper while making the photocopies. To participants in the misattribution condition, she added that subjects had been telling her that “the color annoyed and irritated them,” and she said that the paper might put the participant “in a negative mood.” Thus, Northeast students in that group were offered an alternative attribution for their internal experience of annoyance and irritation. As predicted, they did not see themselves as biased (their self-ratings were at the neutral midpoint of the scale), and they rated their bias as lower than did their fellow Northeasterners, $F(1, 94) = 4.08, p < 0.05$. Apparently, they introspected to find signs of bias, but dismissed those signs as brought forth by the color rather than the content of their survey. The misattribution manipulation had no effect on non-Northeasterners (who had not felt irritated and annoyed by the policy and therefore had no such emotions to misattribute), thereby yielding a significant interaction, $F(1, 94) = 4.23, p < 0.05$ (see Fig. 1.2).

When people make predictions about their future, such as about the likelihood that they will be happy in their new job or the likelihood that they will get cancer if they keep smoking, their predictions often are unrealistically positive (Armor & Taylor, 1998; Helweg-Larsen & Shepperd, 2001; Taylor & Brown, 1988; Weinstein, 1980). When making those predictions, though, people generally feel motivated to make an objective assessment and do not experience introspective signs of bias. This suggests that if individuals rely on introspection to assess their bias, they may be more likely to deny bias in judgments that they have actually made (and for which they therefore possess introspective cues suggesting the

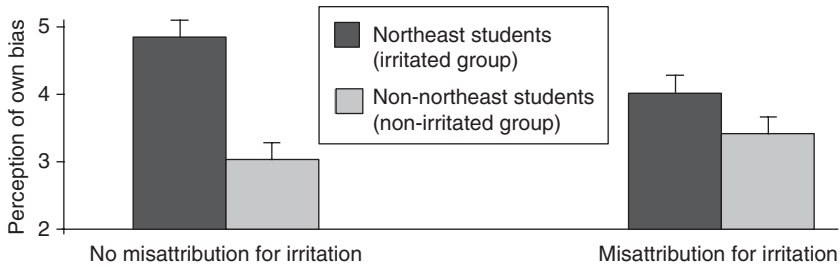


Figure 1.2 Participants from the Northeast were irritated by the policy and took that irritation as a sign of their bias. When offered an alternative attribution for that irritation, they no longer saw themselves especially biased.

absence of bias) rather than judgments that they have only contemplated making. Ehrlinger et al. (2005) found this result in the context of college students making predictions about their future versus contemplating making those predictions. The students either reported the likelihood of various positive and negative outcomes occurring in their future, such as contracting lung cancer, or having a good job, or they imagined how they might respond if asked those questions. Consistent with the introspection illusion, those who responded to the questions—and therefore were likely to have introspective “evidence” of their objective and unbiased intentions—were less likely to acknowledge the possibility of bias in their judgment than were those who only contemplated completing the survey.

2.2. Self–other asymmetry

The foregoing review suggests that, when assessing their bias, people place heavy weight on information obtained via introspection. The self–other asymmetry component of the introspection illusion involves placing comparatively less weight on others’ introspections when assessing those others’ bias. Because biases generally operate nonconsciously, and consequently tend not to reveal themselves via introspection, that self–other asymmetry could account for people’s tendency to see themselves as less biased than others.

Most of us have engaged in political arguments with individuals whom, as the argument progressed, we came to view as ideologically biased to the point that rational debate seemed impossible. We may have been amazed to find that those individuals thought the same thing about us—that is, that we were the ones who could not be reasoned with because of our “knee-jerk liberalism” or “hard-core conservatism.” Consistent with this everyday experience, experiments have shown that people are heavily influenced by partisan ideology when evaluating policy issues, but that they generally deny that influence, even while they see it and even exaggerate it in others (Cohen, 2003; Robinson et al., 1995).

Pronin et al. (2007) explored a source of that bias blind spot in the self–other asymmetry component of the introspection illusion. Collegiate residents of northern California were randomly assigned to be either voters or observers of those voters in an experiment concerning political initiatives allegedly up for vote in the state of California. The initiatives were pretested to ensure that they had no apparent partisan bent and each one was then randomly linked to the Democratic or Republican Party. For example, an initiative to increase the maximum cargo size at the Port of Los Angeles was allegedly backed by the Democrats. For each initiative, the voter participants read a description of it, then listed their thoughts about it (Cacioppo & Petty, 1981; Taylor & Fiske, 1981), and then indicated how they would vote on it. They also indicated their political affiliation with the Republican or Democratic Party. Each observer participant was assigned to a voter participant. The observers read the descriptions of each initiative; they also saw their voter’s thoughts about it, their voter’s indication of how he or she would vote, and their voter’s party affiliation. Both voters and observers rated how much the voter’s positions were influenced by party affiliation, and they then rated how they made that assessment.

Voters were heavily influenced by their political party in choosing their positions. At the same time, the usual asymmetry in bias perception emerged whereby voters thought that they were less influenced by their party than did observers. More importantly in terms of the introspection illusion, voters and observers reportedly considered different information when assessing party influence. A self–other asymmetry emerged whereby voters claimed to have paid more attention to their thoughts than observers claimed to have. These self-report claims were corroborated by content analysis of the voters’ thought-listings. Those listings were coded for indications that the voter had consciously thought about his or her political party’s position when thinking through the initiative. The analysis revealed that voters who had consciously thought about their party’s position were more likely to impute ideological bias to themselves than were voters who had not had such thoughts. This suggests that voters indeed had relied on their thought content in order to assess their ideological bias. The content of voters’ thought listings did not predict observers’ assessments of the voters’ ideological bias, suggesting that the observers had not relied on that thought content.

2.3. Behavioral disregard

The introspection illusion involves actors not only placing heavy emphasis on introspections but also consequently disregarding behavior—a trade-off that observers are not expected to show. Consider an everyday occurrence familiar to most teachers: A student performs poorly on a test and then complains about the test’s unfairness or lack of validity (a complaint not

voiced by those who performed well). To an outsider, the student's complaint seems self-serving. But when asked to consider whether her judgment might be biased, the student denies this possibility, citing flaws with the test and the fact that she feels no motive to protect her ego. By focusing on this internal information, the student fails to pay sufficient attention to her behavior of criticizing the test after scoring poorly on it.

This example was the subject of an experiment by Pronin and Kugler (2007). Test-taker participants took what they believed was a test of social intelligence for which the experimenters sought to determine its validity. Previously, Pronin et al. (2002) had shown that takers of this test display the classic self-serving bias (those told they have done poorly view it as relatively invalid, those told they have done well view it as relatively valid); they also found that takers of this test are more likely to impute this bias to a fellow test-taker than to themselves. Pronin and Kugler's experiment aimed to learn what information test-takers and observers rely on in assessing test-takers' bias. In their experiment, the test-takers all were told that they had *performed poorly* on the test. They were then asked to think aloud about the test's validity (their thoughts were tape-recorded) prior to providing a numeric assessment of that validity and evaluating whether that assessment may have been biased by their score on the test. Observer participants each saw a test-taker's scored test and saw that test-taker's assessment of the test's validity. Half of the observers heard the test-taker's verbalized thoughts, in order to allow for a test of the differential valuation component of the introspection illusion (discussed next).

The results showed the usual bias blind spot; test-takers viewed themselves as less biased than did observers. Recall that all of the test takers were assigned a low score on the test. Thus, a behavioral sign of bias involved their rating the test as low rather than high in validity. The bias blind spot appeared to be rooted in test-takers' versus observers' differential inclination to look to this behavioral sign of bias. Observers (regardless of which type) relied on that behavior—they imputed more bias to test-takers who were more rather than less harsh about the test. That is, observers showed a positive correlation between their assessment of a test-taker's bias and that test-taker's negative assessment of the test. Test-takers, by contrast, tended to ignore this behavior. Those who criticized the test after receiving a low score saw themselves as no more biased than those who praised it after receiving a low score (Fig. 1.3A).

The same pattern of results emerged in a study in which actors rated themselves relative to average on various traits. Observers saw the actors' trait ratings (and half of them were given access to the actors' ongoing thoughts while making those ratings). Actors showed the typical bias of rating themselves as "better than average." The bias blind spot also emerged: Actors were less likely to see the bias in themselves than were observers. Moreover, the bias blind spot appeared rooted in test-takers'

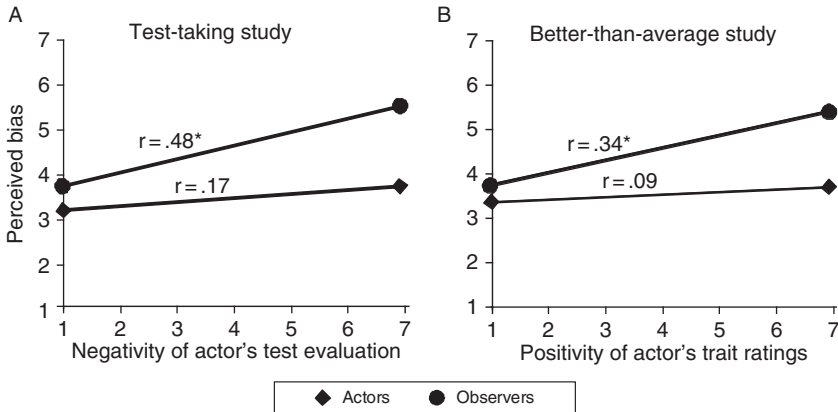


Figure 1.3 (A, B) In two experiments (each involving a different bias), observers paid attention to actors' behavior when assessing those actors' bias, whereas actors did not significantly attend to their own behavior. $*p < 0.05$ (Pearson r).

versus observers' differential inclination to look to behavior. As shown in Fig. 1.3B, observers relied on behavioral signs of bias—they imputed more better-than-average bias to actors who rated themselves further above average. Actors, by contrast, showed no such correlation between how much better-than-average bias they imputed to themselves and how far above average they had rated themselves. Participants' self reports also supported this finding. Observers claimed to have placed more weight on behavior than did actors (indeed, an interaction effect emerged whereby observers claimed to focus more on behavioral than introspective information and actors claimed the reverse).

2.4. Differential valuation

Our introspections are, of course, often available to us only. And, self–other differences in the weighting of introspective information likely can reflect that. However, research also suggests a differential valuation component of the introspection illusion, whereby people's greater weighting of their own introspections is in part due to their greater valuation of those introspections.

Recall that the test-taking and better-than-average studies described above included two types of observers: those provided with introspective access and those not provided with that access. As can be seen in Fig. 1.4, the self–other asymmetry in perceptions of bias (the “bias blind spot”) emerged regardless of whether observers were given introspective access or not. The fact that observers' evaluations of bias were unaffected by

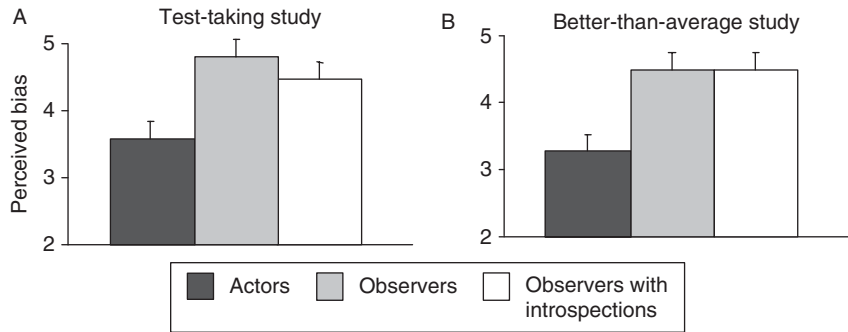


Figure 1.4 (A, B). In two experiments (each involving a different bias), actors saw themselves as less biased than did observers—regardless of whether those observers were or were not privy to the actors’ introspections.

whether they were provided with introspective information suggests that they did not give significant weight to that information.

One might wonder, though, whether observers’ disinclination to rely on these introspective reports reflected their mistrust of those reports rather than a disinterest in actors’ introspections. Not surprisingly given the unconscious nature of bias, actors’ introspective reports generally did not reveal conscious bias (3 of 27 actors in the test-taking study, and 1 of 32 in the better-than-average study, showed any awareness that they might be biased). Perhaps this led observers to suspect the genuineness of actors’ reports. In order to test that question, new groups of observers were asked whether they viewed the reports as accurate, understandable, and genuine accounts of what the actor was really thinking. The large majority (in both studies) reported viewing the accounts as such, and the results persisted when participants who provided (or observed) reports that were viewed as suspect were excluded from analysis. Apparently, observers’ low reliance on introspective information, and their preference for relying on behavior, did not reflect overt skepticism about the genuineness of their access to the actors’ introspections.

In considering these two studies, it seems participants operated as though they had different definitions of “bias” depending on whom they were considering. They seemed to view bias as an introspective phenomenon, defined by internal motives and intentions, when judging it in themselves, but as a behavioral phenomenon, defined by action, when judging it in others. Pronin and Kugler (2007) explored this possibility. College students read about various situations where bias might occur, such as: “You’re gambling, and the roulette wheel has now landed on red four times in a row.” They then indicated how they would define bias in that situation, by

choosing either an introspective definition (e.g., “You think that since there has been a streak of red, black must be due to come up next.”) or a behavioral definition (e.g., “Although your prior bets have all been small, you now place a rather large bet—on black.”). Half of participants received the wording described above. The other half instead were cued to think of another person when reading each description (e.g., “Linda is gambling, and the roulette wheel has now landed on red four times in a row”). All participants responded to the same question: “What might it mean to be biased in that situation?” The result was that participants were more likely to define bias in terms of introspection, and less likely to define it in terms of behavior, when cued to think about themselves rather than another person. For example, on the above roulette question, self-raters chose the introspective definition over the behavioral one 68% of the time, whereas other-raters chose it 42% of the time.

Other studies add further support for the behavioral disregard component of the introspection illusion. For example, Pronin and Kugler (2007) asked people how *valuable* it would be for a person to rely on introspection, and on general theories of behavior, for judging the participant’s own or a peer’s susceptibility to the self-serving bias. Participants reported that it would be more informative for someone to try to get inside the participant’s head in order to assess his or her bias than to look to behavior—but that it would be more informative for someone to look to their peer’s behavior than to try to get inside that peer’s head.

Another way to explore the possibility that people place too high a value on their own introspections is to see what happens when people are taught about the sometimes questionable value of introspection. An experiment by Pronin and Kugler (2007) taught that lesson. Students came to the laboratory for a study that they were told concerned comprehension of scientific information. They read a short piece (allegedly from *Science*) that described classic studies illustrating the automaticity of behavior and the concomitant shortcomings of introspection (e.g., Bargh et al., 1996; Berkowitz & LePage, 1967; Darley & Latane, 1968; Devine, 1989; Nisbett & Wilson, 1977a). The article, titled “Unaware of Our Unawareness” (from Wilson et al., 1995), described the role of unconscious cues in guiding behavior and judgment, as well as people’s unawareness of that role and their consequently inappropriate reliance on introspection. In a control condition, students read an irrelevant scientific article. Then, in what participants believed was a separate experiment, they assessed their susceptibility, relative to their classmates, to various judgmental biases. The result was that students who received introspective education showed no bias blind spot, and differed significantly from those in the control condition (who showed that blind spot). Providing people with information about the perils of valuing introspection seemed to have led them to overcome the bias blind spot; this suggests that over-valuation of introspection contributed to it.



3. THE INTROSPECTION ILLUSION IN SOCIAL PSYCHOLOGY

Although the basic components of the introspection illusion initially were identified in the domain of bias perception, the utility of the illusion as a construct rests in part on its ability to bring together a wide range of important social psychological findings under a common theoretical account. This section of the chapter reviews evidence of the underlying role of the introspection illusion in various phenomena that share a source in people's placing heavy value on introspective information about themselves (information based on looking to internal thoughts and feelings) even while they place heavy value on extrospective information about others (information based on looking to external behavior).

3.1. Judgment and decision making

People frequently have to predict their own behavior. Unfortunately, their predictions are often wrong (e.g., Bazerman, 2006; Gilovich et al., 2002a). Research suggests that these mispredictions can arise from people's heavy weighting of their own introspections (e.g., positive intentions) at the expense of considering other information (e.g., population base-rates, past behavior). Because people do not show this heavy valuation of others' introspections, they sometimes can be more accurate in predicting others' behavior than their own.

Whether trying to finish a big project or just make it on time to an appointment, people often do not leave adequate time for the task. Buehler et al. (1994) tested the psychological sources of this *planning fallacy*. College students predicted how quickly they (or others) would complete various work projects, such as their honors thesis. The actual time that it took the students demonstrated that they were over-optimistic about how long it would take them to complete the projects, whereas they were more accurate in predicting others' completion times. The reason for the students' inaccuracy in self-prediction involved the fact that they focused on their industrious motives and intentions when predicting their own task completion times, rather than focusing on their past behavior or the behavior of others in similar situations. Indeed, when the students were led to put aside their ongoing motives and intentions—that is, when they were specifically instructed to focus on their relevant previous behavior—they made self-assessments that were more accurate.

People's prediction errors extend beyond the planning fallacy. Epley and Dunning (2000) asked students to predict how much money they and their peers would contribute to a campus charity drive. The students

overestimated the amount of money they would contribute, and were more accurate in their predictions about their peers. This asymmetry arose from their reliance on internal information—in this case, information about positive intentions—when making predictions about their own behavior, combined with their reliance on external information—in this case, information about the base-rate of charitable behavior in the population—when making predictions about others' future behavior (see also Koehler & Poon, 2005). Another example of this asymmetry involves Kahneman and Lovallo's (1993) observation that entrepreneurs often are over-optimistic about the odds of success of their own risky business endeavors, even while onlookers make more sober (but also more realistic) predictions. The divergence, they suggest, is due to something akin to the behavioral disregard component of the introspection illusion: The entrepreneurs focus on their energy, motives, and intentions at the expense of considering their own past failures and those of others in similar situations, whereas onlookers are more sensitive to that base-rate information.

Gilbert, Wilson, and their colleagues (Gilbert et al., 1998; Wilson & Gilbert, 2000, 2003) have shown that the weight people place on their introspections can lead them to mispredict their future thoughts and feelings. In one experiment, Wilson et al. (2000b) asked college football fans to estimate what they would be thinking about, and how they would feel, on the days following an upcoming game. The fans, who were absorbed in thoughts about the game when completing the survey, displayed a focalism error. Their over-attention to their ongoing thoughts caused them to incorrectly predict that in the days following the game they would continue to think about it (and to feel elated or distressed, depending on whether their team won or lost). When the fans were experimentally induced to focus on their *behavior* in the days after the game (i.e., by writing about what activities they would be doing) rather than on their current thoughts and feelings, they no longer overestimated the degree to which they would be thinking about the game and feeling emotional about it. This suggests that errors in affective forecasting may be at least partially rooted in the excessive weight that people place on introspective information when making those forecasts (see also Buehler & McFarland, 2001; Schkade & Kahneman, 1998).

3.2. The self

People see their true selves as best captured by their ongoing feelings and subjective experiences; they are more prone to view others as captured through behavior or stable traits (Andersen & Ross, 1984; Johnson & Boyd, 1995; Pronin et al., 2001). This self-other asymmetry in concern with introspective information, a key component of the introspection illusion,

helps to account for some of the unique ways in which people view the self as opposed to other people.

For one, people's greater focus on their own introspections leads them to think that they have a richer inner life than do others, and one that is filled with more intense feelings (Johnson, 1987; McFarland & Miller, 1990). It also leads people to assume that they are relatively "unknowable" via overt observation (Pronin et al., 2001). That assumption gives rise to an *asymmetric insight illusion*: People feel they know others better than others know them. In one study, Pronin et al. (2001) asked pairs of college roommates how well they knew their roommate, and how well their roommate knew them, on a variety of dimensions. Both roommates in each pair generally thought they knew their roommate better than vice versa, which is logically impossible. Consistent with the idea that this asymmetry arose from the roommates' placing more weight on their own than their roommates' introspections, the asymmetry was amplified for knowledge about characteristics that have a largely introspective component (e.g., true feelings, underlying motives) as opposed to for more visibly observable characteristics (e.g., messiness, risk-taking). The results of a separate study by Pronin et al. (2001) further supported the introspection illusion mechanism. Respondents were asked to complete the sentence "I am most like myself when I . . .," or they were asked to complete the same sentence about when a friend was most like him or herself. Respondents viewed their true selves as revealed in introspective moments involving private thoughts and feelings 72% of the time, whereas they viewed their friend as revealed in those moments only 28% of the time.

The flipside of people's belief that their own introspections tell the full story about them is their belief that others' actions tell the full story. For example, during a campus water shortage, students read deep into their classmates' showering behavior to infer how much they cared about the campus community—even while they saw their own behavior as relatively unrevealing (Monin & Norton, 2003). Those who showered during the crisis inferred that others who showered cared little about the community in comparison to themselves; those who had not showered inferred that others who had not showered cared *more* in comparison to themselves. The students apparently looked to their internal attitudes (which barely differed between showerers and nonshowerers) in order to infer their own caring, whereas they looked to others' behavior for inferring that caring.

This tendency to give heavy weight to others' behavior can help to account for the *interview illusion* (Nisbett & Ross, 1980), whereby people think they can learn a great deal from interviews when the reality is that interviews often have little diagnostic value (e.g., Dawes, 1994; Kunda & Nisbett, 1986). Interviewers often feel confident relying on interviewees' behavior in order to infer more stable internal states—such as passion, mental stability, or drive. In making such inferences, interviewers pay

attention not only to interviewees' carefully composed replies but also to their implicit or uncontrolled responses, such as nonverbal gestures, off-the-cuff remarks, or unintended slips of the tongue. The very unintentional and unmonitored responses that people often view as meaningless in their own case, people often view as meaningful in the case of others (Pronin et al., 2001). In a classic (though perhaps apocryphal) example, Sigmund Freud, famous for his tendency to infer phallic-oriented mental life from others' seemingly incidental behavior, once said about his *own* cigar smoking: "Sometimes a cigar is just a cigar." Like Freud, most people tend to infer others' internal states from their observable behavior (Gilbert & Malone, 1995; Heider, 1958; Ichheiser, 1949; Jones & Davis, 1965; Ross, 1977), even while they would discourage such inferences about themselves.

Finally, it is worth noting that people's self concepts are typically characterized not only by their emphasis on internal thoughts and feelings, but also by their generally positive or self-enhancing nature (Krueger, 1998a; Kwan et al., 2004; Sedikides et al., 2003; Taylor & Brown, 1988). That fact likely reflects people's basic need to protect and affirm their sense of self (Fiske, 2004; Leary & Baumeister, 2000; Steele, 1988; Tesser, 1988). Accumulating evidence suggests that people's overly positive self-perceptions also derive from their reliance on introspection and disregard of behavior when evaluating themselves. This idea, that the introspection illusion can contribute to self-enhancement effects, receives full attention in the later section on self enhancement.

3.3. Attitudes and attitude change

Perhaps the most obvious use of introspection is for determining one's preferences when one does not have a readily retrievable attitude in memory. If asked about one's attitude towards Pepsi or the President, one may have a stored evaluation that immediately pops to mind (e.g., Fazio, 1989). If not, though, one is likely to consult one's accessible thoughts and feelings in order to determine a response (e.g., Schwarz, 2007). In that case, individuals often show the usual tendency of placing too much weight on their ongoing introspections. The result is that they can be misled in predicting their "true" attitudes (i.e., those capturing their more stable preferences), and they also can be misled in inferring what those true attitudes derive from.

One reason why it can be a mistake for individuals to place heavy weight on their introspections for inferring their attitudes is that people can hold "implicit attitudes" of which they are completely unaware (Bassili & Brown, 2005; Greenwald & Banaji, 1995; Wilson et al., 2000a). Looking inward to assess attitudes and preferences only makes sense to the extent that they are explicit, rather than implicit. However, even when people are concerned with their explicit attitudes, the process of introspection itself can

misguide people as to the nature of their true attitudes and preferences (Wilson et al., 1993, 1995). When individuals introspect about their attitudes (e.g., about what type of movie—comedy, drama, or action—they like best), they focus on whichever thoughts and feelings are most accessible at that moment. As a consequence, they overweight that information (e.g., if they think of a recent comedy they liked, they might infer that comedy is their favorite). In one experiment Wilson et al. (1993) asked college students to choose among types of posters that they could take home. Some of those students were instructed to introspect about their choice and the reasons for it before making that choice. Those participants were less happy with their choice than were their peers who did not introspect about the reasons for their preference. The former group placed too much weight on the introspections that they generated at that moment in time, and thus lost sight of their more enduring attitudes. In a related study, participants who consulted their thoughts before making complex decisions about consumer products (such as cameras or airplane tickets) were less satisfied with their purchases than were those who took a similar amount of time before making their decisions but did not spend that time consulting their thoughts (Dijksterhuis et al., 2006).

These studies suggest an ironic reason why people sometimes find themselves unhappy with their decisions about what poster to put on their wall or what vacation destination to visit: That dissatisfaction may result not from a failure to look inward to their attitudes and preferences, but rather from the usual introspection illusion of looking inward *too much*. In such cases, an observer oblivious to one's introspections about one's difficult decisions or the reasons for one's preferences might be better than oneself at inferring one's true preferences.

The introspection illusion can lead people not only to incorrectly infer their attitudes but also to incorrectly infer the source of those attitudes. Vast sums of money are spent on advertising, all with the hopes of persuading people to buy new electronic gadgets, eat more fast food (and take more diet pills), and vote for one politician over another. Yet, most people believe that they are relatively immune to such campaigns. People show a *third-person effect* whereby they view themselves as unpersuaded by the mass media even while they view others as influenced by it (Davison, 1983; Perloff, 1993). This effect appears to be rooted in the introspection illusion. Media appeals often exert their influence outside conscious awareness. For example, consumers' attitudes can be influenced by mere exposure to a product (e.g., Fang et al., 2007) or by the carrying over of an irrelevant mood state (e.g., Gorn et al., 1993). People, therefore, often deny their susceptibility to media campaigns because they look inward to find evidence of it ("If I were affected by that commercial, I'd know it."). In the case of others, people recognize that influence because they assess it by relying on observations of behavior (e.g., "Hal buys whatever gadget they show on TV.") and

intuitive theories (e.g., “People will buy anything if you put a gorgeous model next to it.”).

The introspection illusion suggests that individuals will acknowledge media influence on themselves in cases where introspective cues suggest that influence. An experiment by Gunther and Thorson (1992) supported that hypothesis. University students viewed commercials that varied in whether they elicited a strong internal reaction (i.e., ads perceived as high in emotional content). The researchers found that the study participants showed the usual third-person effect—they saw themselves as less susceptible than others to the commercials—*except* for ads that elicited a strong emotional response. For those ads, which left behind discernible introspective traces of their impact, people saw themselves as more influenced than others.

3.4. Social influence

Classic studies in social psychology have demonstrated the surprising degree to which experimental subjects conform to those around them. Yet, when we teach these studies, our students often deny that *they* would similarly conform. Indeed, even the subjects in those studies often denied having conformed: Participants in Darley and Latane’s (1968) classic bystander intervention experiments denied that their peers had influenced their action. Likewise, participants in Sherif’s (1937) classic autokinetic experiments denied having conformed in the judgments they made. More recently, Pronin et al. (2007) reported an “alone in a crowd of sheep effect” whereby people tend to deny their susceptibility to conformity and social influence even while they readily recognize the susceptibility of those around them. This asymmetry is rooted in the introspection illusion.

In one study by Pronin et al. (2007), college students read descriptions of various instances of conformity and social influence. For example, they read about the tendency for people to unconsciously mimic the physical gestures of conversation partners, such that they might cross their legs if their partner’s legs are crossed (Chartrand & Bargh, 1999). The participants then rated their own susceptibility to each instance, relative to that of their peers. Not only did they show a general tendency to see themselves as less conforming than their peers, but, consistent with the introspection illusion, the effect was moderated by whether the particular example they read about operated nonconsciously or left introspective cues. That is, when conformity left introspective traces (such as when it involved intentionally choosing one’s attire in order to “fit in” at a formal event or religious ceremony), individuals did not deny their relative susceptibility to social influence.

This effect is not limited to abstract scenarios or conformity-obsessed teenagers. Berger and Pronin (2007) surveyed drivers of BMW cars and found that they viewed their own luxury car purchase as less influenced by

status and conformity than that of another BMW driver whom they knew ($M_s = 2.70$ vs 4.93 , 7-point scale), $t(27) = 4.90$, $p < 0.001$. One might wonder whether this asymmetry in conformity perceptions reflects *social desirability* rather than the introspection illusion. Consumers might view social influence as an undesirable reason to buy a product. Pronin, Berger, and Molouki tested that question. College students evaluated their own versus their classmates' purchases of a trendy personal music player (the "iPod"). They were led to view social influence in purchasing an iPod as either desirable (i.e., they were told that it offers people a shared experience which is important for being socially connected) or as undesirable (i.e., they were told that it prevents people from thinking for themselves and being independent). The result was that participants saw themselves as less socially influenced in their purchase, *even* when they had been led (as confirmed by a manipulation check) to view that influence as positive. The students were unaware of the impact of social influence on their iPod ownership and, by virtue of relying on their introspections, they denied that influence even when they saw it as a good thing. In the case of their peers, the students recognized that influence because they were less prone to disregard the obvious fact that their peers had bought the same item that so many others also owned.

3.5. Interpersonal interaction

All too often, social interactions do not go as planned, and people are left feeling hurt, angry, or confused. Although negative outcomes such as this are to be expected when individuals' intentions toward each other are exploitive or unkind, such outcomes are surprising (and disappointing) when people's intentions are kind and generous. In these cases, individuals' surprise often stems from the introspection illusion—they place a great deal of weight on what they know internally, whereas others judge them based on what they observe externally.

For example, cooperatively minded negotiators often incorrectly assume that their partners will view them positively. Their assumption derives from the fact that they focus on their cooperative motives, which they assume are transparent, whereas their partners focus on their overt actions, which are ambiguous. The negotiators' assumptions are distorted by an *illusion of transparency*, whereby they assume that their internal motives are transparent via external observation (Van Boven et al., 2003a; Vorauer & Claude, 1998). That assumption could derive from the introspection illusion. It involves actors placing heavy emphasis on their assessments of their internal states (in this case, their cooperative motives)—such heavy emphasis, in fact, that they neglect to recognize that those internal states are not visible via external observation. Consistent with the self–other asymmetry component of the introspection illusion, observers instead judge actors based on overt

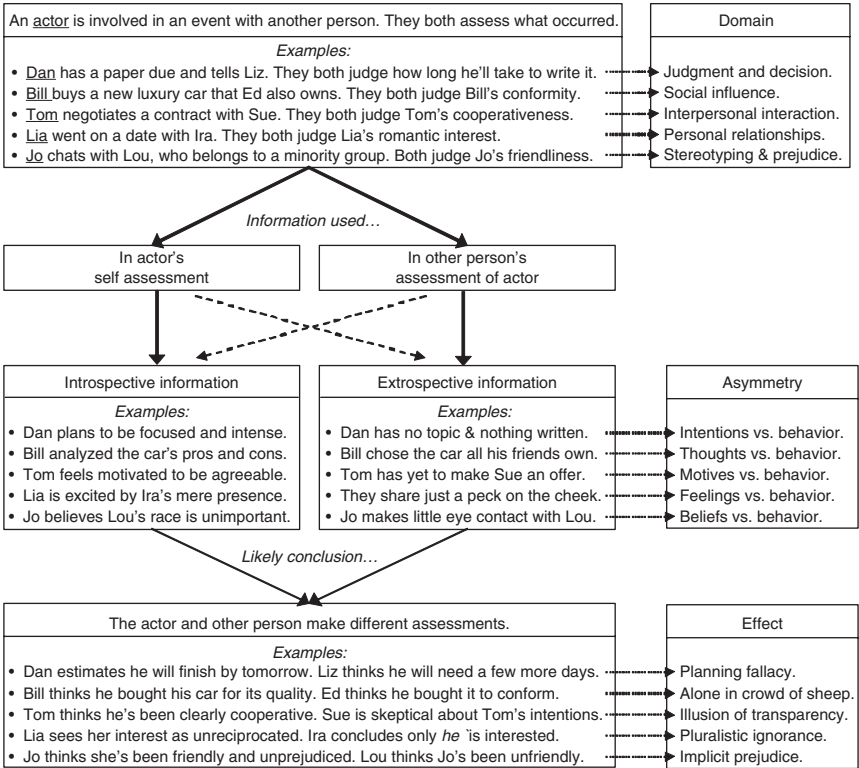


Figure 1.5 The introspection illusion in perception of self and others produces important psychological phenomena.

behavior. Figure 1.5 illustrates this instance of the introspection illusion (and a number of other instances discussed in this section).

Information that is available via introspection often involves motives and intentions, as it does in the case of transparency illusions. At other times, that information can involve thoughts about one's outward appearance as when, for example, one is embarrassed about a bad hair day or proud of a new outfit. Researchers have demonstrated that people show a *spotlight effect* in such situations: they overestimate the noteworthiness of their actions and appearance (Gilovich et al., 2000, 2002b). That effect may seem contradictory to the introspection illusion (given the illusion, why would actors be so focused on their behavior as to over-estimate others' notice of it?), but it is in fact consistent. The spotlight effect seems to occur when actors' outward actions and appearance are salient in their introspections (e.g., when they feel self-conscious about wearing a silly tee-shirt; Gilovich et al., 2000). In such cases, what actors lose sight of is that their appearance is less salient visually than it is in their own thoughts—because visually there is no

spotlight shining on them. Spotlight effects thus differ from illusions of transparency, in that the former involve the assumed obviousness of external appearances and the latter the assumed obviousness of internal states, but both seem to reflect the same underlying introspection illusion—involving an emphatic focus on introspections at the expense of considering what is emitted by observable behavior.

Interpersonal interactions can be compromised by people's misestimations of what information they are communicating to others. Such misestimations often reflect people's excessive focus on the thoughts and feelings they associate with their communication (e.g., Epley et al., 2004a; Keysar & Henly, 2002; Puccio et al., 2001). For example, when people mean to terminate a relationship with a romantic partner, their intention to do that can prevent them from recognizing that they may not be sending a clear message in their communications (Puccio et al., 2001). Those who intend to break up may fail to fully convey that intention and instead may deliver ambiguous messages, such as avoiding the other person and making the excuse that they have been "really busy," or suggesting that perhaps it would be good to take some time "to reevaluate things." The result, Puccio et al. found, is that those who break up tend to think they have sent a clear message (i.e., the one that they *intended* to send) whereas those on the receiving end tend to feel that they have received "mixed signals." Again, the problem involves people judging their own communications based on what they intend to communicate whereas others are left to judge those communications based on the behavior that can be observed.

3.6. Personal relationships

When we wish to pursue friendships with those who are acquaintances, or when we wish to build intimacy with a romantic partner, the introspection illusion sometimes gets in the way. By placing heavy weight on our introspectively experienced thoughts and emotions, but not on those of others, we sometimes inadvertently put up barriers to relationship closeness.

Consider the case of two individuals embarking on a romantic relationship. Both might wish to initiate a romantic moment, but each might let fear of rejection or of potential awkwardness get in the way of making the first move. At the same time, each might focus on the other's inaction and view it as a sign of disinterest (Vorauer & Ratner, 1996). In such cases, individuals may be concerned by others' inaction ("If he liked me, he would've made a move."), even while they focus on their own internal states ("I like him, but I fear rejection."). This example (shown in Fig. 1.5) is one of *pluralistic ignorance*, in that it involves individuals viewing embarrassment as the cause of their own actions even while they take others' similar actions at face value (Miller & McFarland, 1987; Prentice & Miller, 1996). Shelton and Richeson (2005) found pluralistic ignorance in the context of college

students' pursuit of cross-race friendships. They found that college students would forgo trying to make friends with students of other races, even though they wanted to be friends, because they interpreted those others' lack of trying as indicating lack of interest. Such instances of pluralistic ignorance suggest the operation of the introspection illusion: Individuals judge each other based on information about overt behavior (e.g., failing to make social overtures), while judging themselves based on introspective information (e.g., wanting friendship but fearing rejection). That asymmetry may be particularly pronounced in interracial interactions. Racial divides may encourage the expectation that the other person's internal states will not match one's own (even if the other's behavior does); they also may lead individuals to be even more introspectively focused than normal because of their concerns about the interaction (Shelton & Richeson, 2006; Vorauer & Kumhyr, 2001).

When people make the effort to open up to each other in order to achieve closeness, things still can go wrong. Pronin et al. (2008a) documented such a scenario. In one study, pairs of students were asked to mutually open up to each other about what they valued most in life, such as their family, friends, or career. After doing that, the students generally felt that they had genuinely opened up to their partner but that their partner had revealed little to them. This asymmetry was rooted in the introspection illusion: People who disclosed their values felt they had revealed a great deal because they focused on the thoughts and feelings associated with their disclosure (e.g., the feelings of joy that their family brings them); recipients felt that little had been revealed because they focused on the disclosers' behavior (e.g., a brief and prosaic disclosure) and on relevant base-rates (e.g., family is important to most people). In a different experiment, Pronin et al. explored that mechanism directly. Discloser participants described different values that they held with more versus less emotional intensity and that allegedly (i.e., according to the experimenter) were common versus uncommon among their peers. Recipient participants were exposed to another student's value disclosures. Thus, the experiment employed a $2 \times 2 \times 2$ design (Participant Role: Discloser vs Recipient \times Value Intensity: High vs Low \times Value Uniqueness: High vs Low). The result was as the introspection illusion would predict: A three-way interaction emerged whereby, for disclosers, it was the emotional intensity associated with their values that predicted how much they felt they had revealed, whereas for recipients it was the base-rates (or uniqueness) of the values that predicted how much they felt the discloser had revealed. People judged their own revelations based on the introspections they associated with them, but they judged others based on overt behavior and base-rates.

This effect is likely to compromise attempts to reach intimacy. Disclosers, by virtue of their introspective focus, are likely to feel that they have communicated a great deal, and are therefore likely to feel rejected when

others respond as though little of meaning has been exchanged. Listeners, by virtue of their behavioral focus, also may feel rejected, as they infer that their partner has made little effort to open up. This self–other asymmetry in people’s perceptions of value disclosures may seem to contradict the previously mentioned illusion of asymmetric insight (whereby, in the course of social interactions, people tend to assume that they have learned more about others than others have learned about them; Pronin et al., 2001). In fact, both effects involve the same source in the introspection illusion—that is, in actors’ focus on the internal meaning, thoughts, and feelings that they associate with their disclosures compared with observers’ focus on the behavior emitted by actors. To the extent that actors have little depth of feeling associated with their disclosures (as with off-the-cuff responses in a brief chat), they are likely to view those disclosures as unrevealing; to the extent that they associate intense feelings with those disclosures (as with testaments to deeply-held values), they are likely to view those disclosures as highly revealing.

3.7. Stereotyping and prejudice

Research suggests that most people possess implicit biases that, under certain conditions, lead to stereotyping and prejudice. Modern racism often is characterized by positive explicit attitudes combined with negative implicit ones (“aversive racism”; Dovidio & Gaertner, 2004; Son-Hing et al., 2005). Because people place heavy weight on their introspections, they are likely to conclude that they are nonprejudiced, even in cases when their behavior appears prejudiced to others and base-rates reveal prejudice in their midst.

Experiments support this hypothesis. Dovidio et al. (2002) examined actor–observer differences in perceptions of Whites’ race bias in friendliness—that is, Whites’ tendency to act friendlier toward Whites than Blacks. Such differential treatment can go unnoticed by actors, even when it influences observers, because it typically is emitted via nonverbal and unmonitored behavior (Word et al., 1974). In Dovidio et al.’s experiment, pairs of White and Black students were asked to converse with each other in the laboratory about the topic of dating in the current era. Prior to the interaction, the White participants completed measures of their explicit and implicit attitudes toward Blacks. After the conversation, both participants rated how they and their partner behaved during the interaction. The result was that White participants’ assessments of their friendliness toward their interaction partner were associated with their *explicit attitudes* toward Blacks, but not their implicit attitudes. This suggests, consistent with the introspection illusion, that the participants consulted their conscious introspections (in this case, their explicit attitudes) in order to assess their bias. Also consistent with the introspection illusion, their interaction partners’ assessments were uncorrelated with those explicit attitudes and instead were

correlated with the White participants' nonverbal *behavior* (which, notably, flowed from implicit attitudes). See Fig. 1.5.

The idea that actors rely on their conscious introspections—even when others judge them based on their behavior—has also been suggested by stereotype priming experiments. Chen and Bargh (1997) subliminally primed some of their participants with stereotypes about African Americans as a group. This led the participants to behave in a hostile manner that, in turn, engendered hostility from their interaction partners. Observers were sensitive to this behavior and rated the primed participants as more hostile. The actors themselves, by contrast, noticed their partners' hostility but, consistent with the behavioral disregard component of the introspection illusion, ignored their own behavior and thereby failed to recognize their role in engendering that hostility. In sum, both “actor” and “observer” participants behaved in a hostile manner, and both recognized the hostility of their partner but did not recognize this behavior in themselves. The influence of unconscious bias, whether activated by implicit priming (as in Chen & Bargh's experiment) or by implicit prejudice (as in Dovidio et al.'s experiment), is not accessible via introspection. As a result, people see antagonistic or racist behavior in others that they do not see in themselves. The introspection illusion thereby produces an illusion of nonprejudice. In a later discussion, this chapter addresses the implications of this fact for the persistence of racism and sexism in society.



4. IMPLICATIONS FOR MAJOR THEORETICAL CONCERNS

The foregoing discussion suggests that theorizing based on the introspection illusion can help to account for well-known findings in domains ranging from judgment and decision making to stereotyping and prejudice. Another key component of a useful theoretical framework is that it produces theoretical insights. A number of those are now discussed.

4.1. The perspectives of actors and observers

The current theorizing continues the tradition in social psychology of exploring differences, and similarities, in how people perceive themselves and how they perceive others. That tradition has yielded a number of influential theoretical approaches such as those of Jones and Nisbett (1972) and Bem (1972). Those approaches sometimes seem to make contradictory predictions about the information people look to, and the inferences they make, when perceiving self and other. This section of the chapter discusses the ways in which these apparent contradictions can be resolved by

taking a more nuanced look at these theories and then bringing to bear an understanding of the introspection illusion.

4.1.1. Divergent versus similar perspectives

Perhaps the most obvious distinction among these theoretical approaches involves whether they propose that the dominant source of information processed by people *differs* when people perceive themselves versus others. Jones and Nisbett (1972) described one potential difference—they suggested that people look to dispositional factors (e.g., personality) when considering others but situational factors when considering themselves. More recently, Malle (2005) also proposed a divergence in actors’ versus observers’ perspectives. As shown in Table 1.1, these theorists’ approaches can be contrasted with those of Bem (1972) and Nisbett and Wilson (1977b), which often are distilled to variants of the idea that people look to the *same* information when considering themselves and others.

In trying to reconcile these distinct theoretical perspectives, it is important to consider the differing conditions on which each is focused. Bem (1972) and Nisbett and Wilson (1977b) focus on conditions in which perceivers make inferences about attitudes or judgments that have *not* been guided by conscious thought and reflection. Bem explicitly constrains his claim of actor–observer similarity to this condition. He posits that this similarity occurs “[only] to the extent that internal cues are weak, ambiguous, or uninterpretable” (p. 2). Similarly, Nisbett and Wilson’s central interest involves cases where we “tell more than we can know”—that is, where our judgments or attitudes are influenced by cues outside of introspective awareness (p. 321). Under these conditions, actors are expected to look to the same information as observers because these are conditions in which actors lack privileged or unique information.

This analysis suggests that the apparent contradictions among these theories can in part be reconciled by the fact that they concern different conditions. This clarification, however, does not completely settle the question. The theories are still in some tension about how common it is for actors to find themselves in these different conditions. Bem’s theorizing,

Table 1.1 Some theories of self and other perception

Theorist(s)	Dominant source of information	
	For self	For other
Bem	Behavior	Behavior
Jones and Nisbett	Situation	Traits
Nisbett and Wilson	Theories	Theories
Malle	Unobservables	Observables

inspired by a behaviorist analysis, suggests that it is common to have weak introspective cues and therefore to look at oneself as an observer would. By contrast, Jones and Nisbett suggest that it is common for actors to have unique access to internal information, and to look to different information than observers. They note that “typically, the actor has more, and more precise, information than the observer about his own emotional states and his intentions” (p. 85).

Modern research on the role of nonconscious processes in guiding human judgment and behavior (e.g., Hassin et al., 2005) points to the weakness and poor diagnosticity of introspective cues. However, theorizing about the introspection illusion suggests that Jones and Nisbett were right, nevertheless, in suggesting that people look to different information for assessing the self versus others. The theorizing suggests that even under conditions when internal cues are weak and nondiagnostic, people may not look at themselves as an observer would. Instead, they may (1) fail to recognize this problem, and therefore (2) consult whatever internal cues are present anyway. When no such cues are present people may *still* look to those cues—and, finding none, they may take that lack of evidence as diagnostic. For example, in the case of unconscious bias (discussed earlier), people may look for internal signs of bias and, finding none, conclude that this means they were not biased (rather than concluding that they should look elsewhere). Even when people make the same inferences about their attitudes that an observer would, that process is likely to be mediated by considering introspective experience in the case of self. Thus, participants in the classic Festinger and Carlsmith (1959) cognitive dissonance experiment who reported enjoying a boring task after telling someone that it was fun may have looked inward before reporting their enjoyment (if it was not immediately obvious to them). Upon looking inward, they likely would have entertained the question of whether they had said it was fun because they had been paid to say that. In the \$1 condition, they would have found no internal signs of having been tantalized, tempted, or otherwise influenced by the \$1 payment and therefore might have felt confident that the task was enjoyable after all. The money, essentially, could have diverted their attention from introspection about the true source of their behavior (i.e., *implicit* pressure to go along with the experimenter).

A good deal of empirical evidence supports the notion that people look inward to their introspections even when those introspections are weak or absent. Studies have shown that people rely on introspections to judge whether they have been biased even though bias operates nonconsciously and therefore cannot leave introspective cues (Pronin & Kugler, 2007). People also have been shown to look inward for assessing other nonconscious influences such as implicit social influence (Pronin et al., 2007). Furthermore, people have been shown to look to introspective cues for assessing things that have yet to occur, or are out of their mental control, and

therefore could not yield evidence in introspections (e.g., Pronin et al., 2006b; Wegner et al., 2004; Wilson & Gilbert, 2003). These findings, taken together, point to the conclusion that actors rely on internal evidence for making self-assessments (even in cases when they should not). This fact is central to understanding the apparent contradictions between the “similarity” versus “divergence” theories of actors’ versus observers’ perspectives. As is discussed next, this conclusion also is central to yet another apparent contradiction in theorizing about actors’ and observers’ perspectives.

4.1.2. Internal versus external explanations

Among theories that address the differing perspectives of actors and observers, Jones and Nisbett’s (1972) is the most well-known. The heuristic version of it is that people look to *internal* dispositional factors when considering others but *external* situational factors when considering themselves. At first blush, this approach seems to oppose Malle’s (2005), which argues that people look to *internal* (unobservable) factors when considering themselves and *external* (observable) factors when considering others.

This apparent contradiction can in part be resolved by the fact that the theorists have in mind different types of internal versus external phenomena (see Table 1.1). Jones and Nisbett focus on observers’ attention to internal *traits* while Malle focuses on actors’ attention to internal *mental states*. Thus, the two theories may not be in contradiction if it is the case that actors are more prone than observers to look to internal states, whereas observers are more prone than actors to look to internal traits. A study by Robins et al. (1996) offered some support for that possibility: After engaging in a getting-acquainted conversation, individuals made more internal trait attributions (to personality) for their partner’s behavior than their own but tended to make more internal state attributions (to mood) for their own behavior than their partner’s. My students and I tested this hypothesis more directly in a recent pair of experiments (Pronin & Contreras, 2008; Pronin & Kugler, 2008). College students drew crude models with boxes and arrows predicting what they would do on an upcoming Saturday night, with the relative importance of each predictor indicated by the size of its box. In the Pronin and Kugler study, they were told what predictors to include (i.e., *personality, desires and intentions, situation, past behavior*), and in the Pronin and Contreras open-ended study they were told to include whatever predictors they saw fit. To analyze the data, we calculated the total area (length \times height) of each predictor box and then calculated the proportion of the total area attributable to each predictor. In the open-ended study, we first coded each predictor as either *internal-trait* (i.e., personality) or *internal-state* (i.e., thoughts, feelings, etc.), or as *external*.

In both studies, the predicted interaction effect emerged. People appealed to internal traits more for others than self, and to internal states (e.g., desires and intentions) more for self than others (see Fig. 1.6).

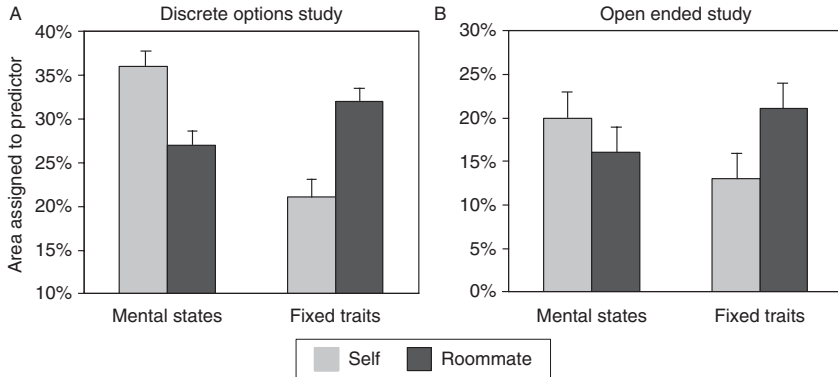


Figure 1.6 (A, B) Scores show percentage of total area devoted to predictor. Interaction effects (self vs roommate \times trait vs state) were significant in the discrete options study, $F(1, 55) = 24.63$, $p < 0.0001$, and the open-ended study, $F(1, 49) = 4.87$, $p = 0.03$. Simple effects (self vs roommate) were significant ($p < 0.01$) except for mental state in open-ended study.

These results suggest that both actors and observers look to internal information, but of different sorts. Consistent with the self–other asymmetry of the introspection illusion, actors are more likely than observers to look to information that comes to them via introspection—such as information about desires and intentions. A remaining question concerns the nature of actors’ and observers’ reliance on *external* information. This question is particularly timely given the results of a recent meta-analysis by Malle (2006). That meta-analysis operationalized the actor–observer bias as a tendency to make internal attributions for others and external attributions for self, and it found little support for the bias when operationalized in that fashion. Theorizing about the introspection illusion suggests that this internal–external distinction does not capture the true actor–observer difference. The introspection illusion framework suggests that actors are likely to view their actions as a product of their internal thoughts, feelings, motives, intentions, goals, and desires (i.e., the information that constitutes their introspections), rather than as a direct offshoot of the external situation. Rather than viewing their actions as *driven* by the situation, actors are likely to view their actions as *responses* to the internal thoughts, feelings, motives, and so on that the situation brought forth for them. This analysis suggests that actors are likely to view internal phenomena as playing a key role in accounting for their own behavior.

This reasoning based on the introspection illusion helps bring into harmony the apparently contradictory approaches of Jones and Nisbett (1972) and Malle (2005, 2006). Consistent with Malle’s framework, it proposes that actors focus more on unobservable information than do

observers (who focus more on external aspects of the actor). Consistent with Jones and Nisbett, it proposes that this difference in focus leads actors to appeal to influences that are mediated by their ongoing internal reactions—most notably, the immediate impinging environment, whereas it leads observers to appeal to influences that are mediated by the person they are attending to—most notably, his or her personality.

Consider a classic instance of the actor–observer bias: Actors attribute their choice of boyfriend or girlfriend to the “situation,” whereas their peers attribute that choice to the actors’ “disposition” (Nisbett et al., 1973). An analysis derived from the introspection illusion suggests that actors’ attributions do *not* literally involve their believing that the situation forced them to date a specific person but rather that the situation generated in them certain internal responses that guided their choice. When a person says he chose his girlfriend because she was “pretty” and “nice,” he may really mean that he chose her because he *felt* attracted to her and happy around her. It is unlikely that this same actor would attribute his choice of girlfriend to situational forces of the sort that elude conscious introspection. In reality, his interest might derive from the fact that he first met her while the two waited to be in a psychology experiment involving electric shock (but no permanent tissue damage) that they had reached only after crossing a rickety bridge together on a beautiful sunny day. However, he is unlikely to explain his choice as a product of these implicit situational forces (despite their demonstrated impact; respectively, Dutton & Aron, 1974; Schachter, 1959; Schwarz & Clore, 1983). More generally, people are unlikely to view their behaviors as affected by situational cues when those cues are nonconscious. Actors’ greater appreciation for the role of the situation in their own behavior, an introspection illusion analysis suggests, likely reflects not so much the belief that they are unwittingly buffeted about by external forces (as though they were a stimulus–response automaton), but rather the belief, afforded by the process of introspection, that their actions are the product of the thoughts, feelings, and intentions that the external situation brought forth for them.

4.2. Self enhancement

The current theorizing suggests a new approach to understanding the classic self-enhancement tendency. Typically, that tendency has been linked to a motive to preserve self-esteem. Researchers also have pointed out various cognitive processes that can act in concert with, or independent of, that motive in order to elicit self-enhancing judgment and behavior (e.g., Dunning et al., 1989; Kunda, 1987; Miller & Ross, 1975; Pyszczynski & Greenberg, 1987). We suggest that self-enhancement also reflects the twin introspection illusion processes of heavily weighting introspective information and disregarding behavior.

Consider a classic case of self-enhancement: People tend to rate themselves as “better than average” on a wide range of traits and abilities (e.g., Alicke et al., 1995; Dunning et al., 1989; Kanten & Teigen, 2008). Although this tendency may serve to bolster the ego, studies have demonstrated a source of it in the more cognitive mechanism of overweighting one’s own but not others’ good intentions and lofty goals. In one study, Kruger and Gilovich (2004) asked individual self-rater participants how much a hypothetical observer would need to consider their individual intentions in order to judge how much they possessed various positive traits, such as friendliness or open-mindedness. Other-rater participants responded to that question about a hypothetical observer judging someone they knew rather than themselves. The result was that people believed their own intentions should be given more weight than others’ intentions. This suggests that self-enhancement in trait ratings is at least partially rooted in people’s tendency to credit themselves but not others with positive traits to the extent that they *intend* to possess those traits. More recent work suggests that it is not only people’s introspections about their intentions that lead them to self-enhance on traits and abilities but also their introspections about their goals and potential. Williams and Gilovich (2008) found that people give more weight to their sense of their own potential in self-assessment than they give to their sense of others’ potential in assessment of others.

Can the introspection illusion account for self-enhancement apart from the better-than-average effect? People self-enhance in a multitude of other ways (Taylor & Brown, 1988), including: (1) making overly rosy predictions about their behavior, (2) denying their susceptibility to bias, (3) overestimating their control over external events, and (4) holding unrealistically positive expectations about their future outcomes. For the first three of these four cases, prior studies suggest that the introspection illusion can produce them. Specifically:

1. As previously discussed, people’s tendency to make *overly rosy predictions* about their behavior—such as their efficiency in completing work projects, or their generosity in helping others—has been linked to people’s overweighting of their own (but not others’) positive intentions and plans relative to past behavior and base-rates (Buehler et al., 1994; Epley & Dunning, 2000).
2. As previously discussed, people’s tendency to claim that they are *less biased* than others has been linked to their overweighting, and overvaluing, of their own but not others’ lack of thoughts, motives, or intentions to be biased—and to their underweighting of behavioral signs of their own (but not others’) bias (Pronin & Kugler, 2007; Pronin et al., 2007).
3. As will be discussed in the forthcoming section, people’s over-estimation of their *control over external events* can derive from overweighting their

thoughts related to those events, such as when a person thinks about an enemy’s suffering and then takes credit for it even when that causation would otherwise seem magical (Pronin et al., 2006b).

Could the introspection illusion also account for the fourth of these self-enhancing phenomena, that is, *over-optimism*? I conducted a new experiment in order to test that question (Pronin, 2008b). College students completed a short version of Weinstein’s (1980) measure of unrealistic optimism, in which they assessed the likelihood of various positive events (e.g., *living past 80*) and negative events (e.g., *being fired from a job*) occurring in their future relative to the futures of their peers. Those participants served as self-raters. After making their likelihood assessments (with response options of *100% less likely*, *80% less likely*, etc., up to *five times as likely*; see Weinstein), they indicated how much they believed that their intentions and desires would determine the likelihood that each event would happen to them, and how much they believed that the base-rate of that event’s occurrence in their peer group would be determinative. Another group of students served as other-raters; they assessed how likely it was that those same events would happen to a student they knew (relative to that student’s peers), and they indicated how much they believed that the student’s desires and intentions, and the overall base-rate, would be determinative.

Students were expected to be more over-optimistic about their own future than about that of another student they knew. Based on the introspection illusion, that over-optimism was expected to be attributable to the higher value participants believed should be placed on intentions and desires in their own case versus that of a fellow student. These hypotheses were supported. Consistent with the classic unrealistic optimism effect, the students were significantly more over-optimistic about their own future than about that of another student they knew (see Table 1.2). More importantly,

Table 1.2 Roots of over-optimism in an introspection illusion

Measure	Self-raters <i>M</i> (<i>SD</i>)	Other-raters <i>M</i> (<i>SD</i>)	Self-other difference <i>F</i> (<i>p</i>)
Over-optimism	2.85 (1.46)	2.02 (1.77)	6.40 (0.01)
Perceived value of <i>Intentions/Desires</i>	6.05 (0.95)	5.13 (0.74)	27.89 (0.0001)
Perceived value of <i>Base-rates</i>	2.22 (1.34)	2.94 (1.38)	6.81 (0.01)

N = 97. Over-optimism was assessed by converting participants’ 15 response options to an ordinal scale where 0 represented the response “equally likely” as other students, positive numbers represented degrees of over-optimism, and negative numbers represented degrees of over-pessimism. Perceived value was assessed via 7-point scale questions (1 = *won’t determine at all*, 7 = *will strongly determine*).

as shown in Table 1.2, people rating the likelihood of their own future outcomes felt that intentions and desires would be better predictors than did people rating the likelihood of others' future outcomes. Viewing desires and intentions as predictive was correlated with over-optimism, $r(95) = 0.39$, $p < 0.0001$, and the Sobel test advocated by Baron and Kenny (1986) revealed that participants' greater over-optimism about themselves than a peer was mediated by the greater weight that they believed should be placed on their own desires and intentions versus those of a peer, $z = 3.24$, $p < 0.01$. The introspection illusion also would suggest that participants' over-optimism about their own futures would be bolstered by the low value they believed should be placed on base-rates in their own case versus a peer's. Consistent with this notion, self-raters felt that base-rates would be worse predictors of future outcomes than did other-raters; viewing base-rates as predictive was negatively correlated with over-optimism, $r(95) = -0.23$, $p < 0.05$, and the self-other difference in valuing base-rates tended toward mediating the self-other difference in over-optimism, $z = 1.71$, $p < 0.10$.

4.2.1. Self denigration

The introspection illusion also can account for something that seems anti-thetic to motivational accounts of self-enhancement: People sometimes view themselves more negatively than others view them (and than they would view others) and sometimes take more responsibility for negative outcomes than they should (and than others would assign them). Most of us probably have judged our performance more harshly than others thought was warranted, or blamed ourselves for unforeseeable accidents or failed relationships that only a seer or a saint could have prevented. These phenomena call into question fully motivational accounts of self-serving tendencies. Often, they point to the role of an introspection illusion that can elicit both self-serving and self-denigrating assessments, depending on the circumstances.

The very same processes of introspective weighting and behavioral disregard that elicit self-enhancement can also elicit overly negative self-assessments—when introspective experience is negative but behavior is not. One example of that involves shyness. Shyness can have introspective components, such as feelings of anxiety and self-consciousness, and also behavioral components, such as quietness and awkward body language. But, the behavioral features are not always present (Henderson & Zimbardo, 2001; Leary & Kowalski, 1995; Melchior & Cheek, 1990). As a consequence, shy people often perceive themselves more negatively, and as more shy, than an observer would, because they focus on introspective signs of shyness, whereas observers notice their relatively “normal” and unremarkable behavior (Melchior & Cheek, 1990). This self-denigrating tendency is not reserved for dispositionally shy people. Pronin et al. (2002) reported evidence suggesting that people in general view themselves as more fearful

of public speaking (a concern related to shyness) than others, presumably because they base their self-assessments on introspective signs of that fear whereas they assess others based on those others' behavior—and, whereas many people experience bouts of nervousness before public speaking, many also manage to conceal that nervousness when in front of an audience.

A pair of studies by Pronin et al. (2006b) involved a quite different example of self-denigration. Students came to the laboratory where they were told they would be participating in an experiment on Haitian Voodoo. They arrived two at a time, but only one was a true participant; the other was a confederate of the experimenter. The true participant always was assigned the role of "witch doctor," and the confederate always was assigned the role of "victim." Participants were asked to place a voodoo hex on their victim, by sticking pins in an authentic voodoo doll. Half of them were led to think evil thoughts about the victim prior to placing the hex. In one study those thoughts were elicited by the victim's obnoxious behavior; in the other they were elicited by an experimenter's instruction to think ill of an apparently pleasant and nice victim. The result in both studies was that compared to participants who were led to have more neutral thoughts about their victim, those led to have evil thoughts reported more responsibility for a headache the victim reported. Importantly, participants felt responsible for their victim's suffering not only in an experiment in which they reported being pleasantly surprised to see their victim suffer (because of his ill temper), but also in an experiment in which they reported feeling negatively about that suffering (because it involved inflicting pain on an innocent victim). Likewise, in another study reported in the same article, television-viewing fans of the *winning* and the *losing* team in a Super Bowl football game felt that they had influenced the outcome of the game when they had thought intently about it—even though the outcome for the losers was not one for which they would want to take responsibility. These studies present a stark example of people's over-reliance on the thoughts available to them via introspection, and of the capacity for that over-reliance to produce both self-elevating and self-denigrating consequences.

Even the notorious better-than-average effect sometimes reverses, and people sometimes view their traits and abilities as worse-than-average. This can reflect dispositional qualities, such as the mental health of the perceiver—depressed people and people with low self-esteem are less prone to hold inflated self views (Taylor & Brown, 1988). Accumulating evidence suggests that it also can arise from the introspection illusion. Studies demonstrating *below-average effects* have shown that those effects are associated with actors' disregard of relevant base-rate information when assessing their traits and abilities (Chambers & Windschitl, 2004; Klar & Giladi, 1999). An introspection illusion account would suggest that actors would disregard that information while excessively weighting introspectively-derived information. Consistent with that hypothesis, Kruger (1999; also Moore &

Small, 2007) found that people are more likely to show below-average effects for difficult tasks (such as joke-telling) and above-average effects for simpler tasks (such as bicycle-riding). This finding suggests not only that people ignore base-rates when judging their abilities, but also that they may instead rely on internal feelings—in this case, feelings of difficulty versus ease.

4.3. Psychological distance

A rich area of recent theorizing involves effects of psychological distance on judgment and behavior. Psychological distance can take a number of forms, including temporal (now vs later), social (self vs other), and hypothetical (real vs hypothetical). Perhaps the most striking finding about these different forms of distance is that people tend to respond to them in similar ways (Liberman et al., 2007; see also Albert, 1977). Theorizing about the introspection illusion offers one possible source of these effects.

People sometimes treat their future selves similarly to how they treat other people. This parallel between temporal and social distance occurs when, for example, people choose to reward the present self at the expense of the future self, much as they might reward themselves over another person (e.g., Ainslie & Haslam, 1992). When we spend money on present selves rather than save for future ones, or when we consign future selves to unpleasant experiences (e.g., painful surgeries) rather than undergo them in the present, we seem to act as though we have “multiple selves” and care about some more than others (Schelling, 1984). The philosopher Derek Parfit (1971) even has argued that people are successions of different overlapping selves and therefore should be treated as such.

This fact is worth contemplating in light of the introspection illusion. Thus far, this chapter has described how people’s different treatment of others versus the self is often rooted in their reduced weighting of others’ introspections. That raises a question: Might the same be true for people’s different treatment of future selves versus present selves?

When considering temporally distant selves, whether at a week’s distance or a decade’s, people literally cannot introspectively access those selves’ thoughts and feelings. Work on *construal level theory* describes the uniqueness of perceiving present selves—as opposed to psychologically distant selves—as characterized by people’s sense that they can “directly experience” themselves in the present (Liberman et al., 2007, p. 353). That uniqueness manifests itself in the concreteness of individuals’ perceptions of present selves, versus the abstraction of their perceptions of psychologically distant selves (Liberman et al., 2007; Trope & Liberman, 2003). The introspection illusion framework suggests another factor that differentiates perceptions of present selves: that is, the focus of attention on thoughts and feelings. Indeed, consistent with an introspection illusion analysis,

experiments have linked people's differential treatment of present selves versus future selves to people's unique ability to "directly" experience their present selves' thoughts, feelings, and other internal mental states. Those experiments have been conducted primarily in the contexts of decision making, and attribution.

4.3.1. Decision making

People's differential decisions for present selves versus for future selves and others can reflect their inattention to introspective information when considering future selves and others. In one study, Pronin et al. (2008b) confronted college students with the prospect of imbibing a murky mix of soy sauce, ketchup, and water for the sake of a scientific experiment. Participants were told that the more one drank the better, because the study concerned effects of "disgust" on judgment. They were asked to decide how much they would drink right then, how much they would drink in a future experimental session (that they were obligated to attend), or how much the subject in the lab room next-door would drink. Based on the introspection illusion, we expected that feelings of disgust about drinking the liquid would be given more weight for present selves than future selves or others and that this would be reflected in participants' decisions about the quantity to be consumed. Consistent with this hypothesis, participants chose about two tablespoons to drink in the present, whereas they chose about half a cup for their future self to drink—the same amount they chose for another person (Fig. 1.7A).

Pronin et al. (2008b) linked this psychological distance effect to greater introspective reliance in the case of present selves. In the disgusting liquid study described above, the dominant introspective experience for participants about to drink the liquid involved disgust. Those feelings of disgust outweighed, for them, any feelings of joy brought forth by the knowledge that they could contribute to the progress of science. Of course, there also are times when people think about helping and find themselves more compelled by thoughts about the joy of helping than about the suffering and sacrifice the helping will entail. The introspection illusion would predict that in such cases people will offer more help on behalf of present selves than future selves or others. This prediction, notably, runs contrary to the lay intuition that people are simply greedy in the present and more willing to promise generosity in the future.

In order to test this hypothesis, we (Pronin et al., 2008b) conducted another experiment. Students were approached on campus by a classmate (a confederate of the researchers) who claimed to work for a nonprofit organization. Her job, she said, involved sending solicitation emails on behalf of various charities that were represented by the nonprofit organization. Her question for participants in the self-present condition was how many of these emails they would be willing to immediately receive (the

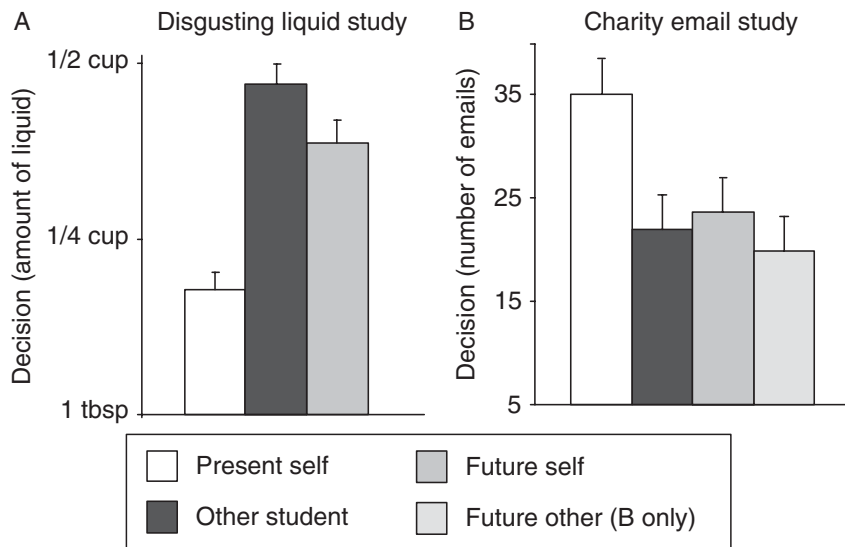


Figure 1.7 (A, B) In the experiment shown in the left panel, introspective experience was focused on the disgust involved in helping (and the joy it would entail was secondary). In the experiment on the right, introspective experience was focused on the joy of helping (and the annoyance was secondary).

more the better, she told them, for the charities and also for her, because she was paid based on that number). In the self-future condition, she told subjects that the emails would not be sent for another 6 weeks. In the other-present and other-future conditions, her question was how many of these emails should be sent immediately (or in 6 weeks) to a fellow student. In all conditions, participants were told that receipt of the emails constituted a minor burden because each one had a receipt function that required opening it before it could be deleted. As shown in Fig. 1.7B, participants were more generous on behalf of themselves in the present than on behalf of a future self or a peer (in the present or future). Notably, participants also reported more positive than negative thoughts about the prospect of receiving the emails. Their dominant internal experience involved positive thoughts about helping rather than annoyance about having a flooded inbox, and they apparently gave that introspective experience more weight in making a decision for themselves in the present.

4.3.2. Attribution

The tendency for people to treat future selves like others also applies to attributions. People tend to offer dispositional explanations for their future actions, much as Jones and Nisbett suggested that they do for others' actions

(Nussbaum et al., 2003). People also tend to describe temporally-distant selves in terms of dispositional traits while describing present selves as situationally variable (Moore et al., 1979; Pronin & Ross, 2006; cf. Miller & Porter, 1980), a phenomenon that mirrors the way people describe others versus themselves (Nisbett et al., 1973; Sande et al., 1988). For example, when asked whether they are *serious versus carefree*, or *introverted versus extroverted*, people tend to reply that it “depends on the situation,” even while they readily pick one trait over the other to describe a friend or themselves 5 years in the past or future (Pronin & Ross, 2006).

These temporal effects on attribution have been linked to the introspection illusion. In a series of experiments, Pronin and Ross (2006) tested that link by inducing participants to focus on the introspections of past or future selves. In one study, participants performed a monologue of themselves at a family dinner at age 14. First, though, half of them were given a crash course in method acting, which is a form of acting in which actors seek “to discover the inner life of the man [or woman] they portray” (Moore, 1984, p. 8). The other half instead were given a crash course in standard acting, which they were told involved trying to appear to an external observer to be the character one is playing. After performing their monologue, participants were asked to respond to a series of questions on behalf of their 14-year-old self, while staying in the role of that self. These questions asked them whether, during the remainder of their day, they would be *serious or carefree or whether it would depend on the situation*, whether they would be *introverted or extroverted or whether it would depend on the situation*, etc. (for 11 trait pairs). The result was that participants who had been induced to introspectively experience the thoughts and feelings of their past self made less observer-like, and more present-self-like, attributions. That is, they attributed fewer traits and more situational variability to their past self than did their peers in the standard-acting condition. This result supports the notion that people typically give less weight to the introspections of temporally distant selves because they do not *experience* those introspections in a way that feels direct. When led to experience the introspections of a past self in that way (via method acting), participants seemed to give those introspections more weight.

Theorizing based on the introspection illusion would predict that people’s perceptions of past and future selves resemble their perceptions of others not only in terms of *decreased attention to internal states* but also in terms of *increased focus on outward behavior*. One way to test that hypothesis is to study the images that people form when they visualize their past and future experiences as opposed to their present ones. Pronin and Ross (2006) asked people who were exercising on stationary bicycles at the gym to form images of their present selves on the exercise bicycle “right now,” or to form images of their past selves on the exercise bicycle “about 1 year ago.” Whereas only 7% pictured their own actions in the images they formed of

present selves, a full 43% saw their past selves in the images that they formed. When imagining past selves, they thus often saw themselves on the exercise bicycle as though they were looking from the perspective of an external observer. Other studies have shown that such observer-like images of past selves are especially common when people literally feel as though they used to be a “different person”—that is, when they believe that they have changed since being their past self (Libby & Eibach, 2002). Consistent with the introspection illusion, observer-like images that focus on behavior are most likely to occur for memories characterized by low recall of internal states such as emotions, thoughts, and physical sensations (e.g., Libby & Eibach, 2002; McIsaac & Eich, 2004; Nigro & Neisser, 1983; Pronin & Ross, 2006).

Taken together, these findings involving attribution and decision-making suggest that one reason for parallels between temporal and social distance may involve similarities in how people experience events that are socially and temporally distant (i.e., in terms of a reduced focus on introspective information). This insight derives from theorizing about the introspection illusion, and also helps illuminate it. It suggests that people’s tendency to treat their introspections as a sovereign source of information about themselves (or, at least, a uniquely important one) may be limited to how they treat their present selves.

4.3.3. Social distance

The preceding discussion suggests that people do not treat the introspections of all their “selves” the same. This finding regarding temporal distance suggests a related question about social distance: Do people treat the introspections of all “others” the same? Or, do people give others’ introspections different weight depending on whether those others are friends, relatives, strangers, or enemies? Theorizing about the introspection illusion suggests that introspections that are directly experienced will be given the most weight. Although directly experiencing others’ introspections is improbable, there may be occasions when people at least have the sense that they are doing that. On such occasions, they may give heavy weight to others’ introspections. This may occur in the context of close relationships, in which partners sometimes feel as though they think each others’ thoughts before the other has them, or that they know what each other is thinking better than the other knows him or herself. It also may be more likely to occur in the context of perceptions of similar others, because individuals may be more likely to view similar others’ introspections as an accurate reflection of reality.

The question of how individuals perceive the introspections of distant versus close, and similar versus dissimilar, others has not been investigated, but the existing research offers evidence of social distance effects that

provide some support for these hypotheses (e.g., Ames, 2004; Liberman et al., 2007; Norton et al., 2003; Prentice, 1990; Pronin et al., 2001). That existing work has shown that people tend to perceive and judge close others (e.g., ingroup members, familiar others, friends) differently from distant others (e.g., outgroup members, unfamiliar others, foes), and that those differences often involve their perceiving close others more in the way they perceive themselves. For example, people experience cognitive dissonance over not only their own discordant behavior but also the discordant behavior of ingroup others with whom they identify—but not outgroup others (Norton et al., 2003); also, people's representations of familiar others resemble their self-representations in content and structure more than do their representations of unfamiliar others (Prentice, 1990).

4.4. Free will

Modern research on the automaticity of behavior has called into question the degree to which people have free will (Bargh, 2008; Hassin et al., 2005; Wegner & Bargh, 1998). That research has shown the impact on people's preferences, judgments, and actions of influences of which they are not even aware. The doubts cast by that research are not the only ones. From theories of hard determinism in philosophy, to behaviorism—and, more recently, willpower and mental control—in psychology, to brain activity in neuroscience, arguments have come forth questioning the extent and even the existence of free will (e.g., Baumeister et al., 1998; Haggard, 2005; Libet, 1985; Skinner, 1971; Soon et al., 2008; Watson, 1982; Wegner, 2002). Nevertheless, people generally are convinced that they consciously will their actions (Wegner, 2002), and a sense of agency is a hallmark of mental and even physical health (Taylor & Brown, 1988; Taylor et al., 2000). The introspection illusion offers an account for why people's belief in their own free will persists, and for why the debate over free will persists in spite of that belief.

Regardless of how we view free will in the abstract, our introspections give us the sense that we have it. We feel as though our desires and intentions precede and influence our actions, and that we face junctures in life where we make genuine, exciting, and even frightening, choices about what path to take. Because actors place such heavy weight on their desires and intentions, they are likely to view those desires and intentions as determinative of their behavior (and thereby as reflecting free will). Because introspections often include deliberations about various possible options for action ("Should I do X, or should I do Y?") and often include counterfactual thoughts ("I did X; maybe I should have done Y"), giving heavy weight to introspections is likely to induce the perception of free will.

Consistent with the introspective weighting component of the introspection illusion, people generally overestimate the causal impact of their

desires and intentions. They show *illusions of control* whereby they assume that their wishes can influence chance or near-chance events (Langer, 1975; Matute, 1996), and they can become convinced that they have caused seemingly magical outcomes that they have merely intended. Importantly, from the perspective of the present theorizing, these beliefs have been associated with actors' unique access and attention to their internal thoughts and wishes (Pronin et al., 2006b; Wegner & Wheatley, 1999).

At the same time that people have frequent experiences that seem to imply their own free will, they often observe those around them and have the sense that *those others'* decisions (e.g., about what career path to pursue) and accomplishments (e.g., in getting accepted at a top college) were predetermined by things such as personality, upbringing, or genes. In the case of others, people are less likely to give credit to those others' goals and intentions and more likely to assume that those others will simply do as those before them have done or as they themselves have done before (Kahneman & Tversky, 1982; also Buehler et al., 1994; Epley & Dunning, 2000; Kahneman & Lovallo, 1993). The introspection illusion framework suggests that these contrasting experiences about the free will of the self versus others might resolve themselves in a simple (though logically untenable) way: People may be more likely to believe that their decisions and actions are guided by free will than are those of others.

In a recent series of experiments, Pronin and Kugler (2008) explored the hypothesis of a self–other asymmetry in belief in the major tenets of free will—that is, that one's actions are unpredictable *a priori*, that there are multiple paths one can pursue, and that personal action is influenced by internal desires and intentions. Asymmetries were observed for each of these beliefs. Specifically, the experiments suggested that:

- (i) *People view their own pasts and futures as less predictable than those of their peers.* The most classic tenet of free will involves the notion of indeterminism, or the *a priori* unpredictability of personal action. College students rated the *a priori* predictability of outcomes in their own past and future, or of those same outcomes in their roommate's past or future (e.g., their or their roommate's *decision to attend Princeton University, choice of major, ultimate career path, marital partner*). For example, self-rater participants were asked: "Think about your choice of what to major in. How easy would it have been to predict that you would end up choosing that major?" The result was that students perceived their own past and future outcomes as less predictable *a priori* than their roommate's ($M_s = 3.86$ vs 4.81 , on 7-point scale), $F(1, 48) = 14.46$, $p < 0.001$. This difference was significant for past and future ($p_s < 0.01$).
- (ii) *People view their own futures as having more possibilities than those of their peers.* A central tenet of the concept of free will is that people are able to

choose among options—to take one path when they “could have done otherwise” (Aristotle, 350 BCE/1985; Chisholm, 1964/1982; Descartes, 1637/1998). We examined whether people saw more possible paths in their own future than others’ future. Waiters and waitresses at two local restaurants were asked to indicate from a set of options all of the possibilities that they saw as plausible with respect to their own, and a co-worker’s, life in the next 10 years. The possibilities were separated into categories for places one might live, jobs one might have, and lifestyles one might lead (e.g., for places one might live, *the same house/apartment lived in right now, another house/apartment in the same town, another state in the Northeast, the West Coast, etc.*). As shown in Fig. 1.8, the waiters and waitresses indicated more possible paths in their own future than that of a co-worker. This held true not only for possibilities that they reportedly saw as “desirable,” such as leading a more fun lifestyle, but also for possibilities that they reportedly saw as “undesirable,” such as leading a more conservative lifestyle.

- (iii) *People view their own outcomes as more driven by internal desires and intentions.* A distinct tenet of free will is that it involves the ability to overcome the influences of situation and personality, to choose what one wants, and to act accordingly on one’s intentions (Frankfurt, 1971; Watson, 1982). If people view themselves more than others as possessed of free will in this sense, then they should be more likely to view their behavior as the product of ongoing wants and intentions (rather than, for example, fixed traits or random circumstances). In the box model studies described earlier, college students essentially were asked to draw regression models of their own or a peer’s future behavior. Those who modeled their *own* behavior assigned more predictive weight to ongoing intentions and desires than did those who modeled a peer’s behavior. In Pronin and Kugler’s (2008) experiment,



Figure 1.8 Restaurant servers circled the options they saw as genuine possibilities for themselves and a co-worker during the next 10 years (seven possibilities were listed in each life domain). For each domain, they listed more possibilities for themselves than a co-worker; all $F(1, 27) > 4.80$, $ps < 0.05$.

participants assigned weight to four predictors (desires/intentions, personality, external causes, past behavior). They saw desires and intentions as the *strongest* predictor of their own behavior (receiving 36% of the total predictive weight, as compared to 27% for others, $F[1, 54] = 13.46$, $p < 0.001$), whereas they saw personality (fixed traits) as the strongest predictor of their peer's behavior (receiving 32% of the total predictive weight, as compared to 21% for self, $F[1, 54] = 24.42$, $p < 0.0001$).

Research in experimental philosophy has begun to take up the question of lay beliefs in free will (e.g., Nahmias et al., 2005; Nichols, 2006). The studies reviewed here suggest that actors' versus observers' asymmetric perceptions of free will could help to account for the seemingly endless persistence of the free will debate. Perhaps it persists because of an introspection illusion. When people introspect, they are compelled by feelings of possibilities, intentions, and choice, all providing them with the sense that they have free will. Yet, when they look at others' actions and outcomes, they are compelled by the notion of determinism. That asymmetry captures the everyday experiences people have when they feel that their own choices are very real (and often stressful, thrilling, and heart-wrenching), while at the same time they are surprised by others' tormenting themselves over choices for which their ultimate decision seems obvious from the outset.



5. ROOTS OF THE ILLUSION

The introspection illusion seems to be at the root of a range of phenomena involving human behavior and judgment. But what gives rise to the illusion itself? Its possible foundations are now discussed from the perspectives of development, culture, and the brain.

5.1. Development

The introspection illusion seems to have roots in human development. In infancy, human beings have trouble separating their internal wishes from external reality (Piaget & Inhelder, 1956). They give tremendous weight to their own introspections, such as their private hopes and wishes, because they are unaware that those hopes and wishes do not directly translate into external outcomes. When an infant believes that his hope for his mother to enter the room will make that event occur, he is in essence over-valuing the import of his introspections.

Infants do not show a similar intuition when it comes to others' internal states. Indeed, they generally *under*-appreciate the role of others' internal states in guiding those others' judgments and actions. Thus, if a toddler's

mother approaches, he may attribute that action more to his desire than to hers. From a developmental perspective, this lack of appreciation is due to the infant's lack of a well-developed "theory of mind"—that is, a set of beliefs about the desires, beliefs, and other mental states of other people (Flavell, 1999; Premack & Woodruff, 1978; Saxe et al., 2004; Wellman, 1990; Wimmer & Perner, 1983). Children acquire a theory of mind through interaction and maturation—those who do not are considered autistic (Baron-Cohen et al., 1985).

These patterns observed in infants persist to some degree straight into adulthood (Woolley, 1997). Even then, people sometimes fail to recognize that their thoughts do not directly translate into action (e.g., Pronin et al., 2006b; Woolley, 1997). Most healthy adults also have "autistic" moments when they forget not only that others have thoughts and feelings different from their own, but even that others have thoughts and feelings at all. One important difference between children and adults may involve adults' learned habit of correcting after-the-fact for their automatic overweighting of information from their own introspections. Epley et al. (2004b) found some support for that hypothesis. Adult and children subjects played a game in which they followed another person's instructions for arranging an assortment of objects, such as toy cars and trucks, in a grid-like pattern (see also Keysar et al., 2000). They were made aware that the other person had an obstructed view of the objects and thus could not see all the objects that they could. The researchers tracked the participants' eye movements during the game in order to examine how well they put aside their unique knowledge in order to follow the other person's instructions. The result was that the adults were quicker than the children to put aside the information that they uniquely held. This suggests that people's over-reliance on their own thoughts and perspectives is automatic, and present from childhood, though adults are more likely to overcome it.

5.2. Culture

Research in cultural psychology has shown that the cultures to which people belong shape how they think and what they think about. From the standpoint of the introspection illusion, it is noteworthy that although Western and Eastern cultures can afford different causal inferences (e.g., Miller, 1984; Morris & Peng, 1994; Norenzayan et al., 2002), people across these cultures seem to arrive at those inferences by introspecting. They may arrive at different inferences nonetheless, either because their introspections differ in content (e.g., Markus & Kitayama, 1991; Nisbett & Miyamoto, 2005) or because they make different assumptions about those introspections.

People in all cultures likely have the sense that information derived via introspection is direct and immediate and therefore valid and reliable.

Nonetheless, all cultures may not subscribe equally to the *introspection myth*—the ensuing belief that introspections provide a complete source of information about one’s mind and self and should thus be afforded sovereign status in self-assessment. Some research suggests that people in more *collectivistic* cultures also may be less prone to assign sovereign status to their own individual introspections and more prone to take into account their beliefs about the introspections of those around them (e.g., “If I want to know which book I will enjoy most, I should consider which one others think I will enjoy”; see Iyengar & Lepper, 1999). Thus, people in more collectivistic cultures may be more prone to think about *others’* introspections when making *self*-assessments. Although both groups may heavily weight their own introspections, people living in more interdependent cultures may also heavily weight others’ introspections—or, at least, their *assumptions* about those others’ introspections.

It also is possible that people in more collectivistic cultures focus less on their own introspections. Eastern cultures that practice meditation, for example, emphasize the importance of using that practice to quiet down one’s introspective world rather than listen to it (Leary, 2004). Cohen et al. (2007) review research indicating that people from collectivistic Eastern cultures are more likely to take an outsider’s perspective on themselves—that is, one that gives more consideration to external appearances and how one looks to others than to internal thoughts and feelings. They trace this cultural divergence to the fact that more collectivistic cultures have tighter norms for guiding behavior and therefore require more attention to how behavior will be perceived. Consistent with this logic, Cohen et al. suggest that collectivistic individuals are likely to disregard introspections in favor of an outsider perspective at times when they are at the center of attention and sense others’ focus on them.

At least some components of the introspection illusion are likely universal, because of their evolutionary adaptiveness. For example, judging others based on their behavior (rather than reported introspections) has clear advantages given the evolutionary costs of being cheated (Cosmides & Tooby, 1992). The evolutionary value of the first element of the introspection illusion—judging self primarily based on introspections—is less clear. It is possible that this element is not adaptive, but instead arises as a byproduct of the existence of consciousness, perhaps accentuated by cultural factors. Alternatively, it may be that assessing oneself based largely on intentions augments the drive to carry out conscious intentions, and thereby to complete tasks too complex to be carried out automatically. Or, it may be that heavy weighting of introspections when judging the self leads to a stronger sense of self, and thereby empowers individuals to break societal boundaries, innovate and lead, all features that have played a key role in natural selection among human populations.

5.3. The brain

Neuroscience research has begun to shed light on the brain processes involved in perceiving oneself and others. Some of these findings are of indirect relevance to the introspection illusion and are worth recounting here with the hope that they may eventually contribute to an understanding of the neuroscientific underpinnings of the illusion.

Experiments have begun to identify brain processes that are involved when people perceive themselves and others. Evidence from fMRI suggests that areas of the medial prefrontal cortex (MPFC) activate when people make judgments about both their own internal states (feelings and intentions) and those of others (Ochsner et al., 2004; Saxe et al., 2006; Zaki & Ochsner, in press). Also, research on *mirror neurons* in monkeys has shown that these neurons fire both when the monkeys perform an action and when they perceive another perform the same action (Iacobini & Dapretto, 2006; Rizzolatti & Craighero, 2004; Rizzolatti et al., 2001). Some researchers have suggested that humans also possess mirror neurons, based on findings that people display similar regions of brain activity for representing motor activity of self and other, but individual mirror neurons have not been identified in humans (Dinstein et al., 2008).

The above findings suggest common brain processes that are uniquely involved in the perception of self and others. The data suggest that when we perceive others, we simulate the mental processes behind their actions. It seems that perceivers may infer others' thoughts and feelings by thinking about how they themselves would think and feel were they those others (rather than by relying on those others' introspections).

This simulation hypothesis raises the question of how people come to impute different mental states and processes to others than to themselves. If people use their own minds in order to simulate others' minds, why would they view others' judgments as influenced by bias when they do not see that influence on their own judgments? An experiment by Mitchell et al. (2005) suggests one possibility. While subjects' neural activity was being monitored, they viewed photographs of people and assessed those people's mental states (i.e., how "pleased" they were to be photographed) as well as, for comparison, their facial symmetry. Afterwards, the subjects rated how similar each of the individuals in the photographs were to themselves. They showed MPFC activation consistent with what they would show in self-perception, but only when considering targets whom they viewed as similar to themselves (and only when considering those targets' mental states). This suggests that people project their mental states onto others when they view those others as similar. That perception of similarity may be influenced by many factors including, for example, knowledge about whether others share one's beliefs and perceptions (Ross & Ward, 1996). When others are seen as dissimilar, people may use other means for inferring mental states, such as

group stereotypes or lay theories (e.g., Ames, 2004; Miller & Ratner, 1998). Those alternative means are consistent with the finding that the bilateral temporo-parietal junction is uniquely recruited when individuals reason about others' mental states (i.e., but not when they engage in self-reflection), suggesting that inferences about others do not always rely on simulation (Saxe, 2005; Saxe et al., 2006). Taken together, these varied neuroscientific findings offer the beginning sketches for a portrait of how individuals' brains respond to others' actions and infer others' internal states. That portrait may eventually help us to understand the neural underpinnings of people's reliance on their own, but not others' introspective contents.

5.4. Further thoughts: Projection and perspective taking

The tendency for people to assume that others share their knowledge and subjective perceptions is generally referred to as *egocentrism* (Epley et al., 2004; Piaget & Inhelder, 1956; Pronin & Olivola, 2006; Royzman et al., 2003). That tendency is characterized by people's inclination to project their own knowledge, attitudes, and preferences onto others, and to simulate others' mental states by consulting their own (e.g., Epley et al., 2004a; Kenny & DePaulo, 1993; Krueger, 1998b; Nickerson, 1999; Robbins & Krueger, 2005; Ross et al., 1977). These mental processes produce failures in perspective-taking in which individuals misunderstand how others perceive events and stimuli.

Taken together, these egocentric processes suggest the possibility of an introspection illusion that extends to a somewhat different place from the one in this chapter. The one described here involves people placing too much weight on information from introspection when making *self-assessments*. Findings involving egocentrism, simulation, and projection suggest that people also place too much weight on information from their introspections when making assessments of *others*. Thus, when trying to predict what others will like, individuals may look inward to their own preferences and project those onto others—especially if they deem those others to be similar to themselves. That hypothesis is supported by the recent finding that when individuals try to take another person's perspective, brain regions normally associated with introspection (in the ventromedial PFC) show increased activation (Ames et al., 2008). This strategy is not without merit. After all, people have much in common and it is not unreasonable for them to assume that what they find painful will also be painful to others, or that what they find delicious others also will find delicious. People can be misled by this assumption, however, when it prevents them from taking into account the role of construal processes in producing their particular reactions of pain and deliciousness (Gilovich, 1990; Griffin & Ross, 1991; Pronin et al., 2004). In such cases, people

may show a variant of the introspection illusion—a variant whereby they place too much weight on information about intentions, knowledge, thoughts, and preferences that they access directly, via introspection, when assessing the intentions, knowledge, thoughts, and preferences of those around them.



6. APPLICATIONS

The introspection illusion describes a set of basic processes involved in people's perception of themselves and others. The utility of identifying basic psychological processes rests in part on how much that identification contributes to our understanding of problems of real-world significance. What follows is a brief illustrative discussion of some areas of potential application.

6.1. Conflict

Why do conflicts arise even among people with the best intentions? The answer lies, in part, in the fact that we tend to judge ourselves based on our motives and hopes, whereas we tend to judge others based on their actions—or, worse yet, based on naïve theories of human behavior that place too much prominence on self-interest (e.g., Miller & Ratner, 1998). This asymmetry is bound to produce conflict.

Consider the case of two people engaged in a negotiation. Both people may approach it with every intention to be fair. Yet, each is likely to pay little heed to the other's introspectively experienced intentions (Vorauer & Claude, 1998). Indeed, each is likely to instead impute greed as the motive behind the other's actions (van Boven et al., 2000). Thus, while both individuals may feel confident and convinced of their fairness because they internally experience signs of that motive, both may fail to consider the other's parallel feelings and instead focus on outward behavior and/or assumptions about what people "in general" are like. That focus is likely to lead to a cynical conclusion, particularly if both sides' behavior involves some posturing and self-interested advocating and if—as suggested by research—both sides' base-rate assumptions involve the idea that people are competitive and selfish in negotiations (Epley et al., 2006; Kruger & Gilovich, 1999; van Boven et al., 2000).

In a scenario such as this, individuals' asymmetric perceptions of self versus other are likely to produce a vicious cycle of competition and conflict, as both parties act based on their assumptions about the other (e.g., Kelley & Stahelski, 1970). Whenever people give themselves credit for their good intentions but judge others based on behavior or cynical

theories about human nature, resentment and anger are inevitable. And, when those on the “other side” accuse us of being unfair, self-interested, or ideological, conflict is likely to worsen as we feel convinced (because of the introspection illusion) of our freedom from those biases and angered by the other side’s unwillingness to look at their own behavior. Indeed, studies have shown that people’s tendency to view themselves as objective and their adversaries as biased is a key force in transforming disagreement into all-out conflict (Kennedy & Pronin, 2008; Pronin et al., 2004, 2006a).

6.2. Persistence of racism, sexism, and inequality

One of the sad facts of entering the new millennium is that racism and sexism have persisted in societies that claim a moral commitment to banishing them. Research on prejudice and stereotyping has provided one key piece to this puzzle: modern sexism and racism can be shown by people who lack conscious prejudice and even hold explicitly positive attitudes (Banaji & Greenwald, 1995; Dovidio & Gaertner, 2004; Fiske, 1998; Glick & Fiske, 1996; Son-Hing et al., 2005). Findings involving the introspection illusion add a second piece to the puzzle: Not only are displays of racism and sexism often unconscious, but people may take their lack of any conscious awareness to mean that they are not in fact racist or sexist.

Recall the results of Dovidio et al.’s (2002) experiment involving cross-race pairs of students conversing with each other. By virtue of the White participants’ focusing on their introspections, and their Black conversation partners’ focusing on their White peers’ behavior, the two groups reached very different conclusions about what had transpired in the interaction. The White participants looked to their conscious introspections (i.e., their explicit attitudes) and concluded that they had been friendly. The Black participants looked to the White participants’ nonverbal behavior (which revealed their implicit attitudes) and often concluded the opposite. It is not difficult to imagine how those divergent conclusions could contribute to the experience of racial inequality. Actors with implicitly prejudiced attitudes judge themselves based on the explicit attitudes that are available to them via introspection. Finding no prejudice in those attitudes, they assume that their behavior is unbiased. Looking back on their interaction or experience, they may even misremember the other person in a way that justifies their prejudiced behavior, thus further concealing their bias (Son Hing et al., 2008). As a result, any implicit bias that influences their behavior goes unnoticed by them and, therefore, uncorrected.

Consider the company CEO who, because of unconscious sexist bias, has never hired a woman for an executive position. If he is convinced—based on his conscious motives and intentions—that he is unbiased, he is likely to be unconcerned about his hiring record. Uhlmann and Cohen

(2005; see also Norton et al., 2004) found that participants who were especially confident in the objectivity of their motives were also especially likely to discriminate against women candidates for a stereotypically-male job (police chief). If this seems counter-intuitive, consider the aforementioned CEO. If his decisions reflect unconscious bias and he dutifully probes his mind for possible sexism, that process is likely to make him yet more confident in his objectivity (because it is likely to reveal nonsexist attitudes and egalitarian motives) and, consequently, more likely to persist in his sexist behavior. On the bright side, making people consciously aware of their prejudices can have encouraging results: In one experiment, when people high in unconscious prejudice were made consciously aware of their prejudice, they behaved with even less prejudice than their low-prejudiced peers (Son Hing et al., 2002). This finding points to the promise of tools that can raise people's introspective awareness of their implicit race and gender biases. One such tool might be the IAT or Implicit Association Test (Greenwald et al., 1998). Anecdotal evidence and research (see Nosek et al., 2007, for a review) suggest that, while taking the test, people sometimes can "feel" their prejudice, in the sense of feeling more difficulty associating a prejudiced-against group with positive stimuli (e.g., associating African American faces with positive images). That feeling can come as a surprise to those who experience it, and might help them to recognize their bias by allowing them to feel it introspectively.

6.3. Ethical lapses

News stories about rampant corruption and breakdowns of ethical behavior seem to fall into two classes: Those involving individuals who intentionally have engaged in dishonest or unethical practices, and those involving individuals who seem genuinely incredulous about the possibility that they have done anything wrong. Although individuals in the former cases may deny their corruption for the instrumental purpose of avoiding censure or punishment, those in the latter cases may defend their integrity out of a genuine belief in it. The introspection illusion can help to account for these latter cases.

On average, doctors receive six gifts annually from pharmaceutical representatives and meet with them four times a month (Wazana, 2000). Although this influences their drug prescription decisions, most doctors are convinced that they are uniquely immune to this sort of influence (Dana & Loewenstein, 2003; McKinney et al., 1990; Wazana, 2000). Why? Their introspections likely tell them so—most doctors probably feel motivated, above all, to provide the best care for their patients. But, when one's office pens and memo pads all advertise for the same cholesterol-lowering drug, that mere exposure might instill positive feelings about the drug

(Zajonc, 1968); Or, those pens and notes might act as “material primes” causing one to act in ways consistent with their presence (Kay et al., 2004). Because such responses are subtle and unmotivated, introspection will not reveal them. And, those who are convinced that they personally are unaffected by gifts are likely to continue accepting them. Those same individuals who judge themselves based on internal motives and intentions are likely to judge their colleagues based on other information, such as behavior (“Ever since Dr. Madsen went on that cruise sponsored by ABC Pharma, she can’t stop praising their latest drug.”), or beliefs about relevant base-rates (“The drug companies wouldn’t keep giving gifts if it didn’t influence people.”), or intuitive theories about human nature (“It’s amazing what a person will do for a free paper-weight.”). They are likely to place less value on their colleagues’ introspections and to be unmoved by their colleagues’ claims of integrity.

Given that lapses in ethics often are not consciously intended (Bazerman & Banaji, 2004), people’s introspective overweighting can account for their denials of those lapses and for the consequent persistence and even escalation of those lapses. It may help explain the behavior of high-court judges who remain convinced of their impartiality while handing down decisions influenced by political partisanship (Miles & Sunstein, 2006, 2008), or the behavior of financial auditors who feel they can provide objective assessments of companies’ financial practices, even while those companies are footing the bill (Bazerman et al., 2002; Moore et al., 2006).

6.4. Introspective education

The present theorizing suggests that each of these applied problems could be solved at least in part by removing people’s introspection illusion. In each of these cases, individuals’ behavior is affected in a way that they themselves would frown upon, but they fail to recognize this because of their undue reliance on introspective information. In an experiment described earlier in this chapter, Pronin and Kugler (2007) found evidence for a potential antidote to that undue reliance and the problems it causes. In their experiment, participants read an alleged article from *Science* describing the effects of nonconscious processes on human judgment and action as well as the concomitant perils of relying on introspection. Those who read the article, as opposed to those in a control condition, showed no tendency to deny their susceptibility to biases—including biases of the sort that engender prejudice (e.g., outgroup bias) and compromise ethics (e.g., self-interest bias).

This result is promising. Past research has suggested that people will correct for their biases when they (1) have an accurate theory about the effects of the bias being committed (Wegener & Petty, 1995; Wilson &

Brekke, 1994), or (2) are aware of the operation of the biasing influence (Bargh, 1992; Wilson & Brekke, 1994). Experiments aimed at inducing bias correction by forewarning people about biases in order to heighten awareness have yielded only mixed success (e.g., Lord et al., 1984; Stapel et al., 1998; Wegener et al., 2006; Wilson et al., 1996). Our result suggests that forewarning will fail in situations where people understand the nature of the bias, but do not appreciate the extent to which it operates without awareness (e.g., when they know a bias induces assimilation to an irrelevant anchor, or self-servingness, but do not recognize the extent to which that induction is nonconscious). The promise of introspective education lies in its suggestion that providing individuals with an understanding of the effects of a bias might be enough—even if people cannot be made consciously aware of its operation—if they can be made aware that they would not be aware of that operation. If that sounds confusing, it may be worth noting that in everyday life people sometimes seem to have an intuitive grasp of the need to avoid unconscious bias. When teachers grade papers blindly, for example, or when orchestras audition potential new members behind a curtain, they perhaps do so not because they can feel the biasing effects of race, gender, or personal affections on their evaluations, but rather because they recognize that they would not feel the operation of those biases even if those biases were operating.

6.5. Pursuits of self-knowledge and social connection

The commandment to “know thyself” is thought to have been carved into the ancient temple at the Oracle of Delphi. Throughout recorded history, individuals have viewed the attainment of self-knowledge as a worthy goal—and a formidable challenge. They also have viewed that goal as best pursued by looking inward. The counsel to pursue self-knowledge, and to do so via introspection, reaches from Socrates’ pronouncement that “the unexamined life is not worth living,” to Maslow’s (1971, p. 53) advice that self-actualization requires one to “break through the defenses against his own self-knowledge, to recover himself, and to get to know himself.”

The current theorizing raises the question of whether introspection truly is the path to self-knowledge. Studies reviewed herein show that people’s inclination to look to introspections for self-knowledge misleads them. When seeking knowledge of their own biases, or of their prejudices, abilities, character traits, or potential, people may be misled by even the most concerted and well-intentioned efforts to look inward. From where, then, can true self-knowledge be derived? When considering those around us rather than ourselves, the answer may seem more obvious. We may readily recognize cases in which no amount of introspection on others’ part will lead them to an accurate picture of themselves. We may think that those

others' attempts to achieve self-knowledge would be better served by consulting their behavior or the ways of human nature more generally. Interestingly, and probably not coincidentally, those strategies are the ones that we would use to increase our knowledge of them. The current theorizing suggests that, at least sometimes, those observer-like strategies will be superior to introspection. This leads to a somewhat ironic answer to the question of where self-knowledge may best be found: On occasion, it may best be found through others' knowledge of oneself. Rather than looking to one's own introspections for self-knowledge, one may sometimes be better off looking to others' perceptions of oneself. That possibility is supported by empirical results (for a review see Dunning, 2005). For example, close others know better than oneself how much time one spends talking to others one-on-one (Vazire & Mehl, 2008), and people's college roommates know better than themselves how long their latest romantic relationship will last (MacDonald & Ross, 1999).

The commandment at the Oracle of Delphi to "know thyself" is generally thought to have been a warning to visitors to the Oracle that they should look inward in order to understand the meaning of the Oracle's prophecies. Given those prophecies' riddle-like nature, it makes sense that some self-reflection would have been useful for decoding their meaning and personal relevance. However, this chapter suggests another reason why that commandment may have been inscribed at Delphi. Notably, people would have encountered that inscription when seeking an outsider's knowledge about themselves (i.e., that of the Oracle channeling the god Apollo). Perhaps the commandment was offered at that time in order to remind knowledge seekers of a fact they might have been ill-prepared to accept: sometimes an external perspective can offer the true path to self-knowledge.

The present theorizing suggests that in order to attain self-knowledge, we should at least sometimes try to see ourselves the way others see us. Previous work has demonstrated that we are likely to often have the reverse desire—to have others see *us* the way that we see *ourselves* (e.g., Sedikides, 1993; Swann, 1990). In pursuing intimacy and connection with others, it is likely to be worth the effort to try to see those others how they see themselves. Theorizing about the introspection illusion suggests that in order to do that, we should focus on others' introspections (their reflections on their internal thoughts, feelings, and motives) rather than on their behavior or on population base-rates. When we make the effort to do that, those others are likely to feel more socially connected and close with us. After all, people's behavior and the ways of human nature in general may say a great deal about who they are, but people often define themselves in terms of their introspections. If we truly want to understand others and connect with them, it therefore is not unreasonable that we should try to value their introspections in a way that at least approximates how much they do.



7. CONCLUSION

The tension between valuing introspections versus observable behavior is a key component of the introspection illusion. In the case of self, we resolve that tension by looking to introspections; in the case of others, we resolve it by looking to behavior. Historically, the tension between looking to introspection versus behavior has also characterized the field of psychology itself. When Wundt established the first experimental psychology laboratory in 1879, he envisioned using introspection as the primary tool of psychological research. By the mid 1950s, B. F. Skinner was famously advocating for the opposite approach—one that completely devalued introspection and treated behavior as the only source of valuable information. To some degree, the debate that began then continues today (Boring, 1953; Jack & Roepstorff, 2002).

Ultimately, however, the technique of introspectionism failed because it could not provide an accurate and unbiased window into the workings of the mind, and behaviorism fell because psychologists were too interested in mental experience to ignore it. In contemporary psychology, two groundbreaking approaches have attempted to overcome the shortcomings of each of these methods by studying nonintrospective responses in order to pursue the goal of understanding mental experience. These approaches are non-conscious priming and brain neuroimaging. According to the present review, people are likely to be more enthusiastic about these approaches when it comes to abstract scientific efforts to understand how “the mind” works, rather than when it comes to specific efforts to understand how “*their* mind” works. In their own case, people are likely to feel that efforts to circumvent their subjective experience by taking pictures of their brains and prodding them with subliminal stimuli are unlikely to tell the real story of how they chose their career, why they fell in love, or even what they will eat for dinner. For themselves alone, people are likely to feel that introspection reigns supreme.

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PERSUASION: INSIGHTS FROM THE SELF-VALIDATION HYPOTHESIS

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Abstract

This article describes the basic mechanisms underlying persuasion highlighting the role of a recently discovered new process—called *self-validation*. Unlike previous mechanisms in attitude change that focus on primary or first-order cognition, this new process emphasizes secondary or meta-cognition. The key notion of self-validation is that generating thoughts is not sufficient for them to have an impact on judgment. Rather, one must also have confidence in them. We review research revealing that this new mechanism can account for some already established outcomes in persuasion, but by a different process than postulated previously, as well as for some new findings. Specifically, we describe how source (e.g., credibility), recipient (e.g., bodily responses), message (e.g., matching), and context (e.g., repetition) variables can influence persuasion by affecting thought-confidence. We also describe how establishing a basic mechanism such as self-validation can provide a novel framework for understanding a variety of additional phenomenon in the domain of persuasion and beyond.

1. INTRODUCTION

Persuasion has always been a major component of human activity. Thinking about the varied situations in which persuasion occurs quickly reveals that it is present in nearly all social interactions, ranging from consumer and organizational settings to academia and health related contexts. As we will describe in this review, understanding *why* a particular persuasion phenomenon is effective is essential for a number of reasons ranging from designing interventions across diverse domains to predicting the long-term consequences of persuasion. Accordingly, the focus of this article is on explicating the psychological mechanisms underlying persuasion with particular attention to a recently discovered process by which a plethora of variables can produce attitude change.¹After providing a brief

¹ Although many constructs can be targeted for change (e.g., emotions, beliefs, behaviors), we focus on attitudes (people's general evaluations of people, objects, and issues) because attitudes serve a key mediational role (e.g., attitude change mediates the impact of belief change on behavior change) and have been the focus of most persuasion research. Nevertheless, the same fundamental persuasion processes can operate regardless of the target of change.

overview of classic perspectives on attitude change research and outlining a general framework that articulates the key processes of persuasion we will (1) highlight a new mechanism of persuasion—called *self-validation*—that ties together the operation of a diverse set of variables, (2) describe how a variety of source, recipient, message, and context variables can influence persuasion by affecting the validation of or confidence in one's thoughts, (3) describe how self-validation plays an important role in other phenomena related to attitudes, and (4) outline other processes by which confidence can influence judgment.



2. OVERVIEW OF CLASSIC AND CONTEMPORARY SOCIAL PSYCHOLOGICAL PERSPECTIVES ON PERSUASION

In the typical situation in which persuasion is possible, a person or a group of people (i.e., the *recipient*) receives an intervention (e.g., a persuasive *message*) from another individual or group (i.e., the *source*) in a particular setting (i.e., the *context*). Successful persuasion is said to occur when the target of change (e.g., attitudes, beliefs) is modified in the desired direction. Over the past 50 years, researchers have developed numerous theories of persuasion (see Petty & Wegener, 1998). We highlight some prominent approaches next.

One of the earliest assumptions was that effective influence required a sequence of steps leading to absorption of the content of a message (e.g., exposure, attention, comprehension, learning, retention; see McGuire, 1985). According to this framework, variables affected the extent of persuasion by affecting learning and retention of message information. However, the available research evidence shows that message learning can occur in the absence of attitude change and that attitudes can change without learning the specific information in the communication (Petty & Cacioppo, 1981; Petty et al., 2008).

Cognitive response theory (Greenwald, 1968; Petty et al., 1981) was developed explicitly to account for the low correlation between message learning and persuasion observed in many studies, and for the processes responsible for yielding to messages. In contrast to the traditional message learning view, the cognitive response approach contended that persuasion depended on the extent to which individuals articulate and rehearse their own idiosyncratic thoughts to the information presented. According to this framework, an appeal that elicits issue-relevant thoughts that are primarily favorable toward a particular recommendation produces agreement, whereas an appeal that elicits unfavorable thoughts toward the recommendation is ineffective in achieving attitude change—regardless of message learning.

Although the cognitive response approach provided important insights into the persuasion process, it focused only on those situations in which people were active processors of the information provided to them. Indeed, the numerous persuasion theories that have promulgated over the past several decades have tended to focus either on persuasion that required relatively high amounts of thinking (e.g., dissonance theory; Festinger, 1957) or relatively low amounts of thinking (e.g., classical conditioning, Staats & Staats, 1958; self-perception theory, Bem, 1972). By the 1980s it was clear that attitudes could be changed both when thinking was high and when it was low. The Elaboration Likelihood Model of persuasion (ELM; Petty & Cacioppo, 1981, 1986) was proposed to integrate the many persuasion theories by arguing that persuasion can occur when thinking is high or low, but the processes and consequences of persuasion are different in each situation.² Although many specific processes of persuasion have been proposed over the years (see Eagly & Chaiken, 1993), the ELM holds that these processes can be organized into a finite set, and that any one variable (i.e., whether source, message, recipient, or context) can influence attitudes by affecting these key processes (Petty & Wegener, 1999).



3. FUNDAMENTAL PROCESSES OF PERSUASION

As just one example of the multiple roles that a variable can play in persuasion situations according to the ELM, consider how a person's incidental emotions can impact evaluative judgments. First and most simply, when thinking is constrained to be low (e.g., due to many distractions or low personal relevance), then emotions tend to serve as simple associative cues and produce evaluations consistent with their valence. That is, positive emotions should produce more positive attitudes than negative emotions (e.g., Petty et al., 1993). When thinking is high, however, one's emotions serve in other roles. First, emotions can be evaluated as evidence (e.g., negative emotions such as sadness or fear can lead to positive evaluations of a movie if these are the intended states; see Martin, 2000). Also, when thinking is high, emotions can bias the ongoing thoughts (e.g., positive consequences seem more likely when people are in a happy than sad state; DeSteno et al., 2000). There is one more process by which emotions can operate when thinking is high—affecting confidence in thoughts and this is discussed in this chapter.

² The ELM is an early example of what became an explosion of dual process and dual system theories that distinguished relatively thoughtful (deliberative) from relatively nonthoughtful (e.g., automatic, intuitive) determinants of judgment (see Chaiken & Trope, 1999; Petty & Briñol, 2006).

When the likelihood of thinking is not constrained to be high or low by other variables, then emotions can affect the extent of thinking. For example, people might think about messages more when in a sad than happy state because sadness signals a problem to be solved (Schwarz et al., 1991a) or conveys a sense of uncertainty (Tiedens & Linton, 2001). If people process a message more when in a sad than happy state, this means that they would be more persuaded by cogent arguments when sad than happy but less persuaded by specious arguments.³ Various theories of emotion and social judgment have incorporated one or more of these processes highlighted by the ELM (e.g., see Forgas, 2001).

Notably, the ELM organizes these processes of persuasion together into one overarching framework (see Petty et al., 2003), and holds that these same processes can be used not only to understand the impact of incidental emotion, but also a long list of other very different variables. For example, source credibility has been shown to serve in the exact same multiple roles observed for incidental emotions under the same circumstances (see Briñol & Petty, *in press*, for a review).

Understanding the multiple processes by which variables can produce persuasion is important for a number of reasons (Petty & Briñol, 2008a,b). First, if any one variable can affect attitudes by different processes, then different persuasion outcomes for the same variable are possible. For example, when thinking is constrained to be low, a happy state might lead to more persuasion than a sad state because emotion serves as a simple positive cue, but when thinking is unconstrained, a happy state might reduce processing of the strong arguments in a message compared to a sad state thereby reducing persuasion.

Second, the ELM holds that the process by which an attitude is formed or changed is consequential for the strength of the attitude (Petty & Krosnick, 1995). Thus, even if two different processes result in the same extent of persuasion, the consequences of this persuasion can differ. For example, when variables such as emotion or a highly credible source produce persuasion through low thinking processes (e.g., serving as a cue) the attitudes formed are less persistent, resistant to change, and predictive of behavior than when the same amount of change is produced by these variables via high thinking processes (e.g., biasing the thoughts generated; see Petty et al., 1995). Thus, understanding the processes by which variables have their impact is important because it is informative about the immediate and long-term consequences of persuasion (see Wegener et al., 2006).

³ When mood management is a salient concern and thinking about the message will be uplifting, people will process more when in a positive than in a negative mood (e.g., see Wegener et al., 1995).



4. THE SELF-VALIDATION HYPOTHESIS: A NEW WAY TO AFFECT ATTITUDE CHANGE

We noted that since its inception, the ELM has described four ways in which any variable can affect attitudes: (1) serving as a simple cue, (2) as a piece of substantive evidence (i.e., an argument), (3) affecting the extent of information processing by influencing motivation or ability to think, and (4) affecting the direction of processing (i.e., introducing a bias to the ongoing thinking). Variables serve in these four roles at different points along the elaboration continuum (Petty & Cacioppo, 1986). Recently, we have proposed and documented a fifth mechanism through which variables can work that also appears to have considerable integrative potential. Unlike the previous roles, which focus on primary or first-order cognition, this new process emphasizes secondary or meta-cognition. Primary thoughts are those that occur at a direct level of cognition and involve our initial associations of some object with some attribute. Following a primary thought, people can also generate other thoughts that occur at a second level which involve reflections on the first level thoughts. *Meta-cognition* refers to these second order thoughts, or our thoughts about our thoughts or thought processes (Petty et al., 2007). In recent years, meta-cognition has assumed a prominent role not only in the domain of social psychology (Jost et al., 1998), but also in memory research (Koriat & Goldsmith, 1996), clinical practice (Beck & Greenberg, 1994), and advertising (Friestad & Wright, 1995). Indeed, meta-cognition has been touted as one of the top 100 topics in psychological research (Nelson, 1992).

One of the most essential dimensions of meta-cognitive thought consists of the degree of *confidence* people place in their thoughts, ranging from extreme certainty to extreme doubt in their validity.⁴ Thus, two people might have the *same* thought, but one person might have considerably greater confidence in that thought than the other, and the greater confidence in the thought, the greater its impact on judgment. This idea is referred to as the *self-validation hypothesis* (Petty et al., 2002). The key notion is that generating thoughts is not sufficient for them to have an impact on judgments. Rather, one must also have confidence in them. The self-validation hypothesis makes a number of straightforward predictions.

First, it suggests that just as assessing attitude confidence has been very useful in determining which attitudes guide behavior (e.g., Fazio & Zanna, 1978), so too would assessing thought confidence be useful in determining

⁴ People can have confidence or doubt in many aspects of their thoughts (e.g., their origin, likelihood, desirability; see Petty, Briñol et al., 2007), but assessments of confidence have focused on the validity dimension because of its fundamental importance in judgment (Kruglanski, 1989).

which thoughts generated to a persuasive communication would predict attitudes. In line with this reasoning, Petty et al. (2002) found that attitude-thought correlations increased as measured thought confidence increased. More specifically, we conducted an initial study in which thought confidence was assessed following a persuasive message along with the traditionally measured variables of thought valence and thought number. In this study (Petty et al., 2002, Study 2) participants were asked to read a persuasive message about a campus issue, to think carefully about the proposal, and to list what they thought about the proposal. Following the thought listing task, participants reported the confidence they had in the thoughts they listed as well as their attitudes toward the proposal. In accord with the self-validation hypothesis, the relationship between thoughts and attitudes was significantly greater to the extent that confidence was relatively high rather than low. In other words, to the extent that people had confidence in their thoughts, persuasion depended on the valence of those thoughts. On the other hand, to the extent that people lacked confidence in their thoughts, persuasion was less dependent on thought valence. When individuals wrote favorable thoughts, increased confidence was associated with more persuasion, but when individuals wrote negative thoughts, increased confidence was associated with reduced persuasion. This study showed that thought confidence could play an important role in persuasion and thus understanding the origins of thought confidence was important.

At first glance, one might think that thought confidence would stem from some objective quality of the thoughts such as having thoughts based on careful analysis or study. Yet, over the past several years we have shown that thought confidence can stem from factors that are linked to validity only in the minds of the perceivers. In one early study, for instance, we showed that thought confidence could be misattributed from an irrelevant source to one's thoughts about a persuasive message and thereby affect whether the thoughts were used or not. In this study, college students were asked to think about past situations in which they experienced confidence or doubt. They engaged in this exercise immediately following exposure to a message containing strong or weak arguments in favor of a new university exam policy (Petty et al., 2002, Experiment 3). Those who articulated past instances of confidence became more certain of the validity of their recently generated thoughts to the message compared to those who reflected upon instances of doubt. That is, the feeling of confidence stemming from the memory exercise was over generalized (or misattributed) to the thoughts previously generated to the persuasive message. Furthermore, this confidence led to greater persuasion when recipients' thoughts were largely favorable (i.e., to the strong arguments), but more confidence led to less persuasion when recipients' thoughts were largely unfavorable (i.e., to the weak arguments). Thus, confidence (vs. doubt) increased the impact of thought valence (and argument quality) on attitudes (see Fig. 2.1).

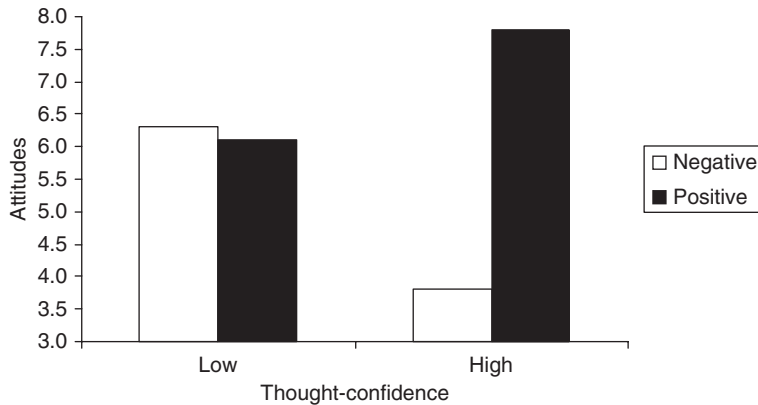


Figure 2.1 Attitudes as a function of thought valence and confidence. Adapted from Petty et al. (2002, Experiment 3).

This work clearly indicates that in addition to considering the number and valence of thoughts elicited by a message, confidence in thoughts is also consequential. Indeed, persuasion attempts can be unsuccessful not because a message has failed to elicit many favorable thoughts, but because people lack confidence in the thoughts they generated.

In these initial studies, the self-validation hypothesis was supported whether thought confidence was measured or manipulated. We also used two different kinds of measures of thought confidence—assessing confidence in each individual thought or in all of one's thoughts together. Furthermore, we measured confidence both before and after attitude expression in different studies. In addition, we used different ways to vary the valence of thinking (e.g., argument quality and instructed thinking). None of these differences changed the self-validation effects observed. Finally, across the studies in this original series, we were able to demonstrate that the effects of thought confidence on attitudes are not accounted for by related constructs, such as belief likelihood or desirability (Fishbein & Ajzen, 1975).

Another contribution of our initial research has been to specify under what circumstances evaluations of our own thoughts are more likely to influence our judgments. Petty et al. (2002) demonstrated that the meta-cognitive activity involved in the self-validation process is more likely to take place when people have the motivation and ability to attend to and interpret their own cognitive experience (e.g., participants are high in need for cognition; Cacioppo & Petty, 1982; when there is high personal relevance of the persuasion topic; Petty & Cacioppo, 1979). There are at least two reasons for this. First, for validation processes to matter, people need to have some thoughts to validate. Second, people need some motivation and ability not only to think at the primary level of cognition but also to think

and care about their thoughts. This fact has led to some interesting results. For example, although individuals who are high in their need for cognition generally rely on their thoughts more than those low in need for cognition (for a review, see, e.g., Petty et al., in press), this effect can be eliminated if people are made to doubt their thoughts. Consistent with this notion, motivation or ability to think will play an important moderating role in the self-validation effects described in this review.

Subsequent research has identified another limiting condition on the self-validation effect. That is, self-validation effects are more likely when confidence is salient following thought generation rather than prior to it. For example, Tormala et al. (2007a) demonstrated that when the validating information (source credibility) preceded the message, it biased the generation of thoughts, consistent with past research (Chaiken & Maheswaran, 1994), but it affected thought confidence when it followed the message. Thus, our findings on self-validation argue that research on persuasion can benefit from considering the *timing* of the key manipulations as placement of the independent variable (e.g., source credibility, experience of emotion) in the sequence of persuasion stimuli can have an impact on the mechanism by which it operates. In line with this notion, timing will play an essential role in many of the studies we review.



5. DISTINCTION FROM OTHER RECENT META-COGNITIVE APPROACHES

Now that the self-validation approach has been described, it is important to note that the self-validation framework shares features with some other meta-cognitive theories in social psychology, but also has notable differences. Most obviously, the self-validation approach agrees with other recent theories on the importance of secondary cognition. However, previous approaches have generally examined and attempted to explain one single source of meta-cognitive influence. For example, Kruglanski's (1989) lay epistemic theory (LET) has been applied to causal attributions and argues that validation processes are affected by the number of causal explanations generated—the more alternative explanations generated for any given event, the less confidence a person has in any one given causal explanation. Generating few explanations, then, leads to greater confidence.

Perhaps the most well known meta-cognitive theory in social psychology is that of Schwarz et al. (1991b) on ease of retrieval effects. In this work, the focus is on the ease with which primary cognitions come to mind and the key finding is that cognitions that come to mind easily are more impactful than those that are difficult to access. In a separate line of work, Clore and colleagues (e.g., Clore & Huntsinger, 2007; Clore et al., 2001) have focused on emotions and have proposed that cognitions accompanied by positive

emotions are more likely to be used than cognitions accompanied by negative emotions because of the promotive nature of positive emotions.

Interestingly, by focusing on particular variables (e.g., number of cognitions, ease, emotion), these theorists have developed rather specific rationales for why and when their particular variable of interest would matter. In contrast, and as will be evident in the studies that we review, the self-validation framework is designed to be a general meta-cognitive approach that can explain the effects of a wide array of variables that have been examined separately under the rubric of different theories. We also aim to explain the impact of variables that have not been considered to have a meta-cognitive impact by any prior theory.

To help understand how the self-validation approach differs from other theories focused on single variables, consider the ease of retrieval phenomena just mentioned. Schwarz et al. (1991a) argue that when thoughts are easy to generate (e.g., generate 2 reasons to buy a BMW), people infer (mistakenly) that there are more reasons available than when they are difficult to generate (e.g., generate 8 reasons). Because of this availability heuristic (Tversky & Kahneman, 1974), generating 2 reasons in favor of something can lead to more persuasion than generating 8 reasons. Furthermore, because the ease effect is presumed to be mediated by use of a heuristic, the ease effect is argued to be more likely when people are not thinking very much (e.g., for a low importance topic; see Rothman & Schwarz, 1998). In contrast, the self-validation approach assumes that easily generated thoughts have greater impact because people infer greater validity of thoughts that are generated easily. This would be true independent of the actual number of thoughts that are generated. Second, the self-validation approach assumes that because a meta-cognitive inference of validity is involved, the ease effect should be magnified under high rather than low levels of thinking. Thus, the self-validation approach postulates a different mediator and different moderation than classic ease of retrieval theory. In a series of studies examining both mediation and moderation of ease of retrieval effects we found that the ease effect was mediated by thought confidence rather than the availability heuristic and occurred to a greater extent when thinking was high rather than low (see Tormala et al., 2002, 2007b). It is important to note, however, that these self-validation findings do not mean that ease cannot affect attitudes by simple heuristic processes when thinking is low. Indeed, we believe that ease, like other variables, can affect attitudes by different mechanisms in different circumstances. However, consideration of the self-validation mechanism provides a new way in which experienced ease or fluency can affect judgments that has not been considered previously.

It is also important to distinguish thought confidence from other theories that aim to deal with multiple rather than single variables. In particular we can distinguish thought confidence from thought diagnosticity (see Lynch, 2006). This is important because like thought confidence, the more diagnostic thoughts are perceived to be, the more they should impact judgments.

In our studies, we hold thought diagnosticity constant for the same situation, and vary thought-confidence. For example, a person might consider a thought very diagnostic (i.e., when it is *relevant* to deciding how one feels in the current situation), but hold that thought with low confidence (e.g., because it came to mind with great difficulty) or high confidence (e.g., because it came to mind very quickly). Obviously, a person might also consider a thought to be perfectly valid (e.g., I am sure the car was yellow) but still realize that that the thought is not diagnostic or relevant now (e.g., I am sure the color of the car has nothing to do with how much I like it). Further distinguishing thought validity from diagnosticity is that the former tends to transcend different situations whereas the latter often changes from situation to situation (see Petty et al., 2007, for further discussion).

In sum, the self-validation notion is that numerous variables can affect attitude change not only by affecting the number or valence of thoughts generated, but also by affecting thought confidence. The self-validation hypothesis provides a completely new mechanism by which a large number of traditionally studied variables can have an impact on attitudes in persuasion situations. After describing some of the initial work in which the self-validation notion was used to account for some classic persuasion variables, we examine how self-validation can provide a novel framework for understanding a variety of additional persuasion phenomena. Finally, we move beyond the persuasion context to briefly describe the possible role of self-validation in other kinds of judgments



6. SOURCE EFFECTS THROUGH SELF-VALIDATION

6.1. Source credibility

One of the earliest and most well-known findings in the persuasion literature is that high credibility sources often produce more attitude change than sources of low credibility. As we outlined earlier for emotion, this effect could result from the several processes outlined by the ELM. That is, depending on the message recipient's extent of thinking, source credibility has been found to influence persuasion by serving as a simple cue, biasing the thoughts message recipients have, serving as a piece of evidence relevant to the central merits of the issue, and determining the amount of thinking that occurs (see, Petty & Wegener, 1998, for a review).

Recently, we have proposed that source credibility can also influence persuasion by affecting the confidence people have in the thoughts they generated to a message. This hypothesis relies on the assumption that source credibility begins by influencing the perceived validity of the information in a persuasive proposal. Consistent with this assumption, Kaufman et al. (1999) found that information from a high credibility source (e.g., *Washington Post*)

was rated as more believable, accurate, factual, and true than the same information originating from a low credibility source (e.g., *National Enquirer*). More important, we argued that when one has already thought about information in a proposal and then discovers that it came from a high or low credibility source, one's thoughts can also be validated or invalidated by this source information. For example, if one learns that a source is high in credibility, one might think that, because the information is presumably valid, his or her thoughts about it can be trusted. If one learns that the source has low credibility, however, one might think the information itself is invalid and thus have less confidence in one's thoughts about this information. That is, if the credibility of the information in a message is undermined, confidence in one's thoughts that were based on that information are likely to be undermined as well.

In an initial demonstration of this possibility, Briñol et al. (2004) exposed participants to strong arguments in favor of the benefits of phosphate detergents. Following receipt of the message, participants learned that the source of the information was either a government consumer agency (high credibility) or a major phosphate manufacturer (low credibility). The self-validation reasoning is that when thoughts are generated in response to credible information, people can be relatively confident in their thoughts, but when people learn that their thoughts were generated to a source of low credibility, doubt is instilled. Although participants in both high and low credibility conditions generated equally favorable thoughts to the strong arguments, participants exposed to the high (vs. low) credibility source had more confidence in their thoughts, relied on them more, and were therefore more persuaded by the proposal.

In a follow-up experiment, Tormala et al. (2006) predicted and found that because of the self-validation role for sources, a high credibility source can lead to either more or less persuasion than a low credibility source depending on the nature of people's thoughts in response to the persuasive message. In two experiments, Tormala et al. (2006) presented recipients with either a strong or a weak persuasive message promoting *Comfrin*, a new pain relief product, and then revealed information about the source (i.e., either from a federal agency that conducts research on medical products or from a class report written by a 14-year-old student). When the message was strong, high source credibility lead to more favorable attitudes than low source credibility because of greater reliance on the positive thoughts generated. However, when the message was weak and participants generated mostly unfavorable thoughts, the effect of credibility was reversed. As illustrated in Fig. 2.2, for the weak message, high source credibility produced less favorable attitudes than did low source credibility because participants exposed to the more credible source had more confidence in their unfavorable thoughts.

Finally, Tormala et al. (2007a) confirmed that source credibility primarily affects thought confidence when the source information follows rather

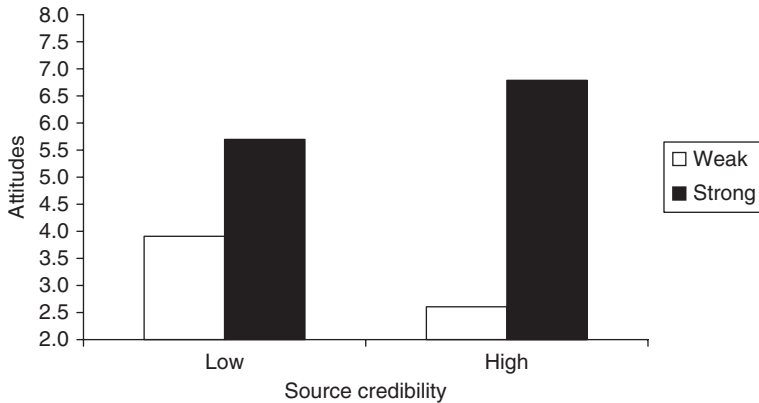


Figure 2.2 Attitudes as a function of argument quality and source credibility. Adapted from Tormala et al. (2006, Experiment 1).

than precedes the persuasive message. In this research, when source information preceded the message, it biased the generation of thoughts, consistent with past research (Chaiken & Maheswaran, 1994). In sum, our research on source credibility shows that the self-validation process should be added to the other mechanisms previously identified for explaining the impact of source credibility on attitudes.

6.2. Source similarity

Although there are some notable studies on the likeability or attractiveness of the source (e.g., DeBono & Harnish, 1988; Petty & Cacioppo, 1983), source factors other than credibility and status have not been extensively studied. Nevertheless, we have collected some initial evidence for self-validation effects of source similarity. In one illustration, Petty et al. (2002, experiment 4) studied how having similar others agree with one's thoughts can increase the perceived validity of those thoughts and thereby increase their impact on attitudes. The undergraduate participants in this study first received a message advocating the implementation of a new comprehensive exam policy at their university. In order to manipulate the direction of the thoughts toward the proposal, the message they received contained adaptations of either the strong or weak arguments on this topic developed originally by Petty and Cacioppo (1986). After listing their thoughts, participants were told that those thoughts were going to be analyzed by the computer and compared with a pool of thoughts of many other students from their own university (Ohio State University). After 10 s, a new computer screen appeared with the ostensible outcome of this comparison. Half of the participants were told that their thoughts had been rejected for future research because they were very different from the rest of

the members of their group. The other half of the participants were told their thoughts had been accepted into the pool for future research because they were quite similar to the thoughts listed by other members of their group.

As anticipated by Festinger's (1950) notion of consensual validation, this experiment found that social consensus information affected persuasion by influencing thought-confidence (see also, Goethals & Nelson, 1973; Orive, 1988a,b). People reported more confidence in their thoughts when these thoughts were said to be shared with similar others than when they were not. When thoughts were favorable toward the proposal, sharing thoughts with others increased persuasion, but when thoughts were not favorable, sharing thoughts with others reduced persuasion. Importantly, the results in support of the self-validation hypothesis were apparent particularly for participants high in need for cognition, who are more chronically motivated to engage in extensive thinking. This finding is similar to the one described above for source credibility, and also is consistent with the notion that meta-cognitive processes tend to be more pronounced to the extent that people have the motivation and ability to engage in considerable thinking.⁵

6.3. Source majority/minority status

One of the most examined source variables in the persuasion literature is whether the persuasive proposal is said to be endorsed by a majority or a minority of other people. Both the conformity and persuasion literatures have accumulated considerable evidence suggesting that endorsement from numerical majorities often exert greater influence than numerical minorities do (e.g., Wood et al., 1994), although sometimes minorities can be more effective (e.g., Crano & Chen, 1998; Moscovici, 1980; Mugny & Perez, 1991). Several of the mechanisms we have already mentioned have been shown to operate for minority sources. Thus, endorsement of an issue by a numerical minority (vs. majority) has led to resistance to attitude change by a low-effort rejection process (minority as a negative cue) when thinking was likely to be low, and by a more thoughtful but negatively biased processing mechanism under high thinking conditions. When elaboration is not constrained by other variables to be high or low, however, minorities have been shown to influence attitude change by influencing the amount of thinking that occurs (e.g., Baker & Petty, 1994; for a review these mechanisms, see, Martin & Hewstone, 2008; Tormala et al., in press).

⁵ Although in this research, agreement with similar others increased perceived validity compared to disagreement with similar others, this could be because the message was on a matter of opinion rather than fact. Following prior work by Goethals and Nelson (1973), it could be that agreement with *dissimilar* others would increase thought confidence if the message was on a topic considered to be a matter of fact rather than opinion. Thus, agreement by similar (vs. dissimilar) others might increase or decrease perceived validity depending on the circumstances, such as the nature of the topic being considered.

We have recently conducted a line of research in which we proposed that minorities can affect persuasion not only by serving as cues or affecting the direction and the amount of thinking, but also by influencing the confidence with which people hold their thoughts in response to the persuasive message (Horcajo et al., 2008a). That is, we proposed that, at least under some circumstances, such as when the source information follows the message and thinking is high, minority influence can operate through self-validation processes.

In one of the studies of this series, participants were presented with a message introducing a new company. The message was composed of either strong or weak arguments about the firm. The gist of one strong argument in favor of the company was that workers report high satisfaction because of the flexibility in their work schedules. In contrast, the gist of one weak argument in favor of this firm was that they used recycled paper in one of the departments during an entire year. After reading and thinking about this information, participants listed their thoughts in response to the company. Next, we manipulated source status by attributing the message to a source in the numerical minority or majority (e.g., 18% vs 88% of their fellow students support the company; see Baker & Petty, 1994). Consistent with the self-validation hypothesis, we predicted and found the status of the source (minority vs majority) influenced the confidence with which participants held their thoughts about the company. Specifically, participants tended to have higher thought confidence when the message was endorsed by a majority rather than a minority. As a consequence, we observed that the majority (versus minority) endorsement increased reliance on thoughts and thus enhanced the argument quality effect on attitudes.

Among other things, these findings are important because in virtually all of the prior studies manipulating minority source status and argument quality, the manipulation of source status has *preceded* presentation of the persuasive message. As explained earlier for source credibility, in this order any variable can affect the amount of information processing that takes place as long as it is not already constrained to be high or low by other variables. In contrast, in the study just described, the status of the source was introduced when processing of the message proposal was already done, and operated through thought confidence. Thus, the effects of source status on attitude change and the mechanisms underlying those effects vary as a function of the timing in which the source information is introduced in the persuasion process.

6.4. Summary of source factors

The self-validation research reviewed in this section has shown that this new mechanism can account for some already established persuasion outcomes (e.g., more persuasion with high than low credibility sources), but by a completely different process than postulated previously (i.e., a credible

source making people more confident in their thoughts and thus relying on them more). Moreover, we have also been able to obtain findings opposite to those typically observed (e.g., when thoughts are mostly unfavorable there is more persuasion to low than high credible sources). Importantly, self-validation not only relates to classic topics in the psychology of the source of persuasion (such as credibility, similarity, and minority status), but it has the potential to provide a useful framework for examining other more novel phenomenon (for an extensive review of source effects on persuasion, see, Briñol & Petty, in press). For example, self-validation can be used to interpret the role of oneself as a source of persuasion (self-persuasion), to examine research on the self versus other origin of thoughts, and to shed light on diverse source matching phenomena. We briefly cover some of these lines of research in subsequent sections of this review.



7. RECIPIENT EFFECTS THROUGH SELF-VALIDATION

There are many recipient variables that are relevant for persuasion that have been studied in the literature. In addition to emotion which we cover in more detail below, important recipient factors include individual behaviors, motives, abilities, and personality (see Briñol & Petty 2005, for a review). We review some recipient factors that have been subjected to a self-validation analysis next.

7.1. Bodily responses

There is a growing interest in studying how people's own behavior can influence information processing and social judgments. Indeed, cognition and judgment are embodied (see Smith & Semin, 2008). One of our first self-validation studies focused on the role of people's own bodily responses—their head movements—on thought confidence and persuasion. Prior research on head nodding had assumed that nodding one's head in a vertical (versus horizontal) manner produced more positive attitudes either because vertical head nodding biased thinking in a favorable direction or because head nodding served as a relatively simple affective cue (Wells & Petty, 1980). Although these roles are certainly possible under certain circumstances (e.g., head nodding as a simple cue when thinking is low), the self-validation hypothesis suggested another possibility—that just as vertical head movements from others can give us confidence in what we are saying, our own vertical head movements could give us confidence in what we are thinking. In a series of studies (Briñol & Petty, 2003), we found that head movements affected the confidence people had in their thoughts, and thereby had an impact on attitudes.

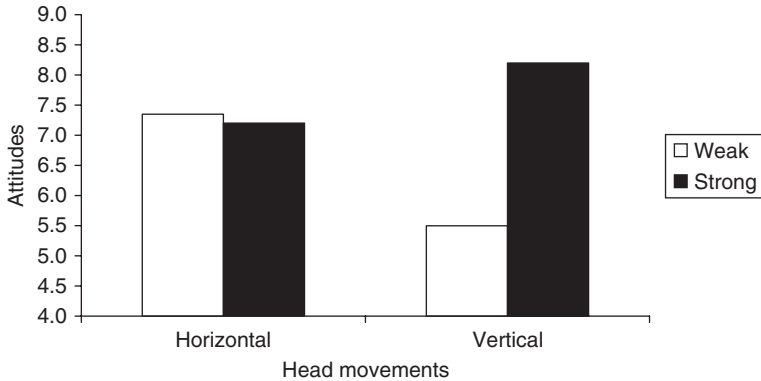


Figure 2.3 Attitudes as a function of argument quality and head movements. Adapted from Briñol and Petty (2003, Experiment 1).

In one study (Briñol & Petty, 2003, Experiment 1), when people listened through headphones to the strong arguments in an editorial advocating that students be required to carry personal identification cards on campus, vertical movements led to more confidence in the favorable thoughts generated and to more favorable attitudes than when horizontal movements were made. However, when people listened to weak arguments about the ID cards, vertical movements led to more confidence in the unfavorable thoughts generated and to less favorable attitudes than when horizontal movements were made. This was the first reverse effect observed for head movements on evaluation (see Fig. 2.3). Additional analyses indicated that the head movements did not have any impact on the number or valence of thoughts listed but did have an impact on the confidence with which people held their thoughts. Furthermore, this thought confidence mediated the impact of head movements on attitudes (Briñol & Petty, 2003, Experiment 3).

The initial studies on the effects of bodily responses through self-validation processes were conducted in traditional persuasion settings in which attitudes change with respect to particular issues and objects following presentation of a message (for a review on embodied persuasion, see, Briñol & Petty, 2008a). It is important to note, however, that the self-validation framework can also be applied to other attitude domains, such as attitudes about oneself (i.e., self-esteem). That is, confidence applies to whatever the salient or available mental contents are at the time. For example, in one illustration of the generality of self-validation processes (Briñol & Petty, 2003, Experiment 4), we asked participants, as part of a presumed graphology study, to think about and write down their best or worse qualities (thought-direction manipulation) using their dominant or nondominant hand (overt behavior manipulation). Then, participants rated the confidence in their thoughts and reported their self-esteem.

Because writing with the nondominant hand is very infrequent and difficult, and whatever is written with the nondominant may appear “shaky,” we expected and found that using the nondominant hand decreased the confidence with which people held the thoughts they just listed. As a consequence, the effect of the direction of thoughts (positive/negative) on current self-esteem was significantly less when participants wrote their thoughts with their nondominant rather than their dominant hand. That is, writing positive thoughts about oneself with the nondominant hand decreased self-esteem relative to writing positive thoughts with the dominant hand, but writing negative thoughts with the nondominant hand resulted in the reverse pattern (see Fig. 2.4).

This experiment reveals that bodily responses can influence self-evaluation by affecting the confidence with which people hold their self-related thoughts. In another study examining this meta-cognitive process in the domain of self-evaluation, Briñol et al. (2009) asked participants to think about and write down their best or worse qualities while they were sitting with their back erect while pushing their chest out (confident posture) or slouched forward with their back curved (doubt posture). Then, participants completed a number of measures and reported their self-esteem. In line with the self-validation hypothesis, it was predicted and found that the thoughts generated about the self only affected self attitudes in the relatively high confidence posture. Conceptually similar to the previous study, the effect of the direction of thoughts on current self-esteem was greater when participants wrote their thoughts in the confident rather than the doubtful body posture.⁶

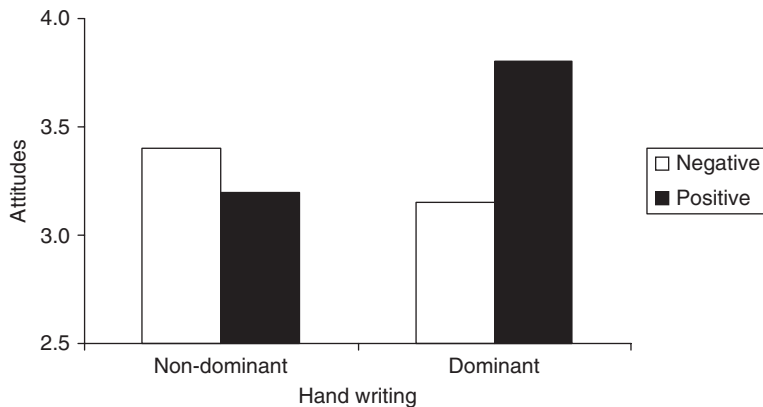


Figure 2.4 Attitudes as a function of thought-direction and hand writing. Adapted from Briñol and Petty (2003, Experiment 4).

⁶ None of the bodily movements or postures we have studied (head nodding, hand writing, slumping) affected the number or valence of thought generated. Only thought confidence was affected.

These studies demonstrated that inducing doubt about possessing positive qualities tended to undermine self-esteem whereas inducing doubt about possessing negative qualities tended to enhance self-esteem. Importantly, Briñol and Petty (2003; Experiment 4) showed that these changes in self-esteem were mediated by changes in the participants' certainty in the self-beliefs listed. Subsequent research has replicated these effects on self-thoughts using other validating variables, including a measure of individual differences in chronic self-confidence (e.g., see, DeMarree et al., 2008a). Taken together, these lines of research also suggest that meta-cognitive confidence can be associated with anything that is currently available in people's minds, including not only thoughts in response to persuasive messages and social issues, but also self-related thoughts.

7.2. Incidental emotions

One of the most fundamental and encompassing aspects of the human condition is emotion. People often rely on their emotions, either intentionally or unintentionally, to shape their judgments and decision making regarding life satisfaction, risk assessment, and so forth (e.g., Forgas, 2001). Thus, a recipient aspect that has been studied extensively in the attitudes domain is the emotional state of the target of persuasion. We noted earlier that as expected by the ELM, prior research has shown that a person's emotions can operate through different processes in different situations (see Petty et al., 2003, for a review).

Research guided by the self-validation hypothesis has shown that emotion can also affect thought confidence. This possibility follows directly from the finding that emotional states can relate to confidence with happy people being more certain and confident than sad individuals (Tiedens & Linton, 2001). If emotion influences thought confidence, then people in a happy state should be more reliant on their thoughts than people in a sad state. In fact, Briñol et al. (2007a) found that when placed in a happy state following message processing, attitudes, and behavioral intentions were more influenced by the recipients' valenced thoughts to the presented arguments than when placed in a sad state following the message (see Fig. 2.5).

In one study (Briñol et al., 2007a, Experiment 2), when participants received a strong message advocating that students should be required to carry personal identification cards on campus (and thoughts were thus mostly favorable), those who were asked to recall prior situations in which they were happy following message processing were more persuaded than those asked to recall prior situations in which they were sad. However, when participants received a weak message on the same topic (and thoughts were mostly unfavorable), the effects of the emotion induction were reversed. Furthermore, the effect of emotion on attitudes was mediated

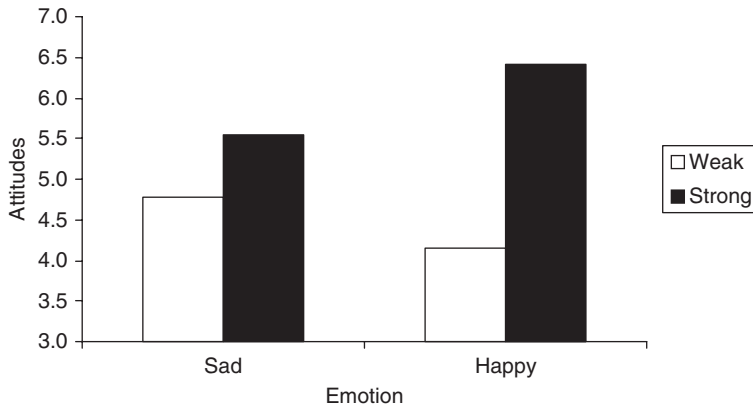


Figure 2.5 Attitudes toward the proposal as a function of argument quality and emotion. Adapted from Briñol et al. (2007a, Experiment 1).

by the confidence people placed in their thoughts with happy individuals expressing more thought confidence than those who were sad. In other studies in the series, these self-validation effects for emotion were confined to situations when emotion followed thought generation rather than preceded it and when conditions fostered high thought (e.g., for individuals high in need for cognition, NC).⁷

It is worth noting that, like much of the previous research on the influence of affect on cognition, our studies on self-validation examined the effects of emotions for which valence and other appraisals such as confidence were operating simultaneously (i.e., were confounded; see, Briñol et al., 2006). Some emotions unconfound the valence and confidence dimensions. For example, anger is negative in valence, but is associated with confidence (see Tiedens & Linton, 2001). Thus, it is important to know if it is the valence appraisal of an emotion that is determining use of thoughts (e.g., *I am angry with my thoughts*—implying nonuse) or the confidence appraisal. To examine these possibilities, we conducted a series of studies in which participants were led to feel anger or surprise after generating positive or negative thoughts toward a persuasive proposal (Briñol & Petty, 2008b). Anger is negative in valence whereas surprise is positive, but anger is associated with confidence whereas surprise is associated with doubt. Consistent with most of the research presented above, we found that the direction of primary thoughts (positive or negative) only affected subsequent judgments when those

⁷ Of most importance for the multiple roles idea outlined earlier, for people low in NC, emotions had a direct effect on attitudes unmediated by thought confidence. That is, for low NC individuals, feeling good following the message acted as a simple cue leading to more positive attitudes when happy than sad regardless of argument quality. As noted earlier, this is consistent with prior research suggesting that low elaboration individuals are more likely to use their emotions as input to an affect heuristic (e.g., Petty et al., 1993).

thoughts were accompanied by an emotion associated with relatively high (anger) but not low (surprise) confidence.

Taken together, our research on emotion suggests that different emotions such as happiness or anger can influence persuasion by affecting the confidence with which people hold their thoughts. The research covered so far on self-validation has focused on the validity dimension of one's own thoughts. That is, we have examined *cognitive* validation. It is important to note that the self-validation approach also holds open the possibility of *affective* validation wherein people infer that their thoughts have made them happy or sad, angry or surprised (e.g., Petty et al., 2007). Thus, although we focus on cognitive validation in this review, we also acknowledge that affective reactions might also exert an impact on attitudinal processes by affective validation (i.e., a valence effect of the emotions). For example, in a preliminary test of this idea we manipulated whether participants felt angry or surprised following the generation of positive or negative thoughts in response to a persuasive proposal (Briñol et al., 2008b). To foster affective or cognitive validation, after these two inductions we asked participants to either write about how they felt about their emotions (affective mindset) or to write about their thoughts and beliefs in response to the proposal (cognitive mindset). For those induced with a cognitive mindset, we replicated previous findings and showed self-validation effects by an emotion associated with relatively high (anger) but not low (surprise) confidence. In support of the possibility of affective validation, however, those induced with an affective mindset felt better and relied more on their thoughts when forming their attitudes following the surprise rather than then anger induction. Among other things, this line of research on affective self-validation suggests that the same emotion can increase or decrease thought-confidence as a function of people's mindset (e.g., focused on how they feel about their thoughts or focused on how valid they think their thoughts are).

7.3. Power

Power has been recognized as a central motivating force in human relationships and action, being considered as one of the most fundamental concepts in social science (e.g., Fiske, 1993). As a consequence, scholars have long argued for the importance of understanding the origins of power and its influence on a variety of outcomes. In a line of research inspired by the self-validation hypothesis, we examined the effect of recipients' power on attitude change. The self-validation prediction is that when induced to feel powerful, people should be more confident in their thoughts. This prediction is in line with prior research that suggests a link between power and approach tendencies (e.g., Keltner et al., 2003).

In one study on power (Briñol et al., 2007c, Experiment 4), participants were first led to generate either positive or negative thoughts about a

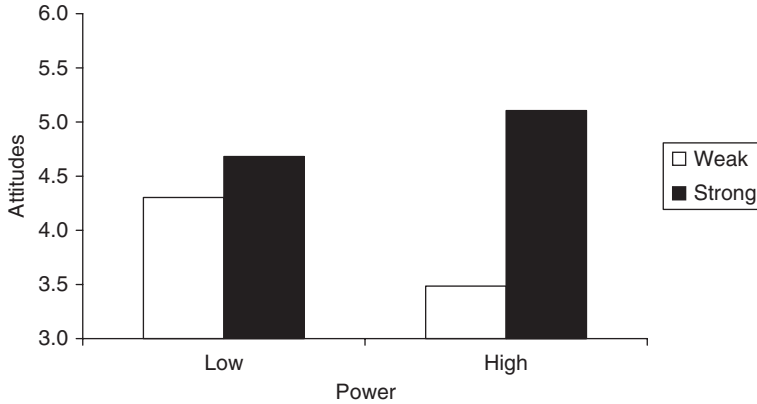


Figure 2.6 Attitudes as a function of argument quality and power. Adapted from Briñol et al. (2007, Experiment 3).

vaccination policy for students on campus. Then the participants were instructed to recall either two incidents in their lives in which they had power over another person (high power condition), or in which someone else had power over them (low power condition). Relative to powerless individuals, those induced to have power following message processing reported greater confidence in their thoughts about the campus policy. As a consequence, the effect of the direction of the thoughts generated on attitudes was greater when power was high rather than low (for an illustration, see, Fig. 2.6). Furthermore, thought-confidence mediated the observed effects of power on persuasion. As in the prior self-validation studies, these effects were greatest under high elaboration conditions and when power followed thought generation.

These studies not only contribute to the literature on persuasion, in which the few studies conducted so far focused exclusively on the power of the source rather than the recipient (e.g., Kelman, 1958), but also have important implications for the study of power. For example, according to the self-validation hypothesis, power is likely to produce either positive (e.g., mitigating conflicts) or negative (e.g., corruption) social outcomes depending on the direction of the thoughts that power holders have in their minds. This is important because the self-validation view argues that meta-cognitive confidence can magnify the effect of any content that is currently available in people's minds, including not only the thoughts in response to persuasive proposals, but also to other cognitions including active goals.

In one study examining self-validation processes in this domain, DeMarree et al. (2008a) first asked participants to complete words related to different constructs, such as competition (C_M_ETE) versus cooperation (e.g., H_LP). Previous research has revealed that when these constructs are activated, they can influence the extent to which particular goals are activated

and people behave accordingly (e.g., Macrae & Johnston, 1998). Next, participants were assigned to a role of high or low power, a manipulation that, as we described above, has been successfully shown to influence the use of thoughts in the domain of persuasion. In line with the self-validation logic, we found primes to influence participant's behavior during a subsequent negotiation simulation, particularly in the situations in which participants were assigned to a role with high (vs. low) power. That is, the more powerful people were found to engage in more competition *or* cooperation, whichever was primed. Thus, as was the case with power affecting validity of thoughts generated in response to persuasive messages, so too does it appear to affect the validity of socially-relevant mental content.

7.4. Self-affirmation

People are often motivated to resist changing their attitudes. Thus, there is growing interest in studying ways to undermine resistance as a first step to persuasion (Knowles & Linn, 2004). One means that has been promulgated to soften a person's resolve is to provide some self-affirmation prior to an attacking message. Self-affirmation theory (Steele, 1988) holds that affirming an important aspect of the self can restore self-integrity when the self has been threatened. When applied to persuasion, self-affirmation theorists have argued that self-affirmation can buffer the self against the threat posed by a counter-attitudinal persuasive message, and thus increase the likelihood that participants will respond to the message favorably (e.g., Cohen et al., 2000). Although the self-affirmation approach has much to offer, it says nothing about situations in which a message does *not* pose a threat to the self. We have argued that in such situations, self-affirmation can affect persuasion by affecting thought confidence.

In a relevant study, Briñol et al. (2007b, Experiment 2) had participants read an advertisement introducing a new cell phone containing either strong or weak arguments. After receiving the message, individuals affirmed either an important or unimportant aspect of their self-concepts. That is, they were asked to write about situations in which they felt or performed in a manner consistent with their most or least important value. In accord with the self-validation framework, this research found greater argument quality effects for self-affirmed than nonself-affirmed participants (see Fig. 2.7). And, once again, in additional studies on self-affirmation, the self-validation effects were obtained only when participants were in high elaboration conditions and the self-affirmation followed thought generation. When the self-affirmation manipulation preceded the persuasive message, it validated the person's own initial point of view, and affected the extent of thinking about the message with more affirmed individuals thinking less. That is, when people feel confident (affirmed) prior to a message, there is

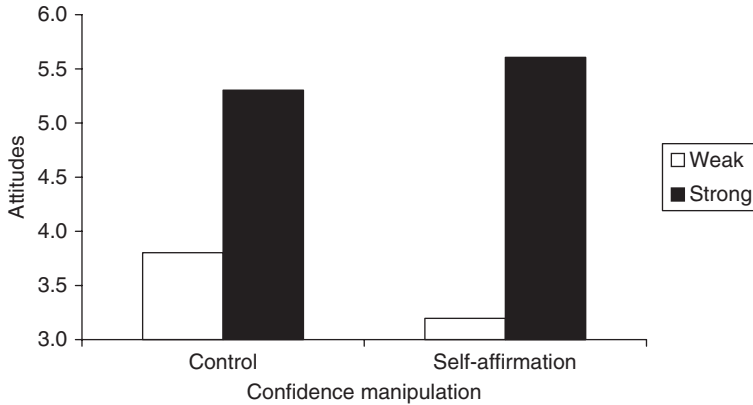


Figure 2.7 Attitudes as a function of argument quality and self-affirmation where affirmation follows the message. Adapted from Briñol et al. (2007, Experiment 2).

more confidence in one's own position, and less need to process the opinions of others than when one is feeling doubtful.

These findings on information processing are consistent with those found by Correll et al. (2004) in a study examining the link between being affirmed prior to a message and the subsequent processing of the message. In their study, participants were recruited for whom the issue of a tuition increase was counterattitudinal and was either important or unimportant to the self. Among participants who did not attach a great deal of importance to the issue (i.e., the message would not be very threatening), there was a trend for affirmed participants to show less sensitivity to message quality and message position than nonaffirmed participants. This pattern is consistent with the idea that self-affirmation lead to decreased thought under these conditions because the affirmation validates a person's existing opinion.

7.5. Ease of retrieval

As noted earlier in this review, considerable attention has been paid to the subjective sense of ease with which new information can be perceived or generated. In their seminal research, Schwarz et al. (1991b) showed that subjective feelings regarding information can be more important than the content of one's thoughts. Although the traditional interpretation of this ease-of-retrieval effect has relied on the availability heuristic approach (i.e., that ease signals that many supporting arguments or thoughts are available; Tversky & Kahneman, 1974), the self-validation hypothesis provides an alternative mechanism by which ease of retrieval effects can occur—at least under high thinking conditions. As described earlier, Tormala et al. (2002) demonstrated that people were more confident in their thoughts when few

rather than many were generated, and this thought confidence mediated the effects of ease of generation on attitudes. Subsequent research has replicated these findings using different paradigms (Tormala et al., 2007b).⁸ As in prior research on self-validation effects, the impact of ease on confidence occurred only under high thinking conditions. Again, this is notable given that the ease of retrieval effect had largely been assumed to be a phenomenon only of low cognitive effort based on the availability heuristic (e.g., Rothman & Schwarz, 1998). According to the ELM, however, ease, like other variables, should be capable of affecting judgments by different mechanisms in different situations.

7.6. Threat and mortality salience

Taken together, the examples in this section illustrate that self-validation can provide a useful framework for understanding how a wide variety of aspects related to the recipient of persuasion operate in producing attitude change. Whether the manipulations involved head movements or ease of retrieval or whether the cognitions were about oneself, others, or objects, self-validation effects were apparent suggesting that people often look for ways to validate their thoughts. Furthermore, a consideration of self-validation processes might expand our understanding of the dynamics of other unexplored recipient variables that could influence persuasion either by increasing or decreasing thought-confidence. As one example, consider research on threat, and on mortality salience (MS).

Our research on self-validation has typically found that meta-cognitive confidence exerts a *magnifying* effect on one's self-related cognitions. In contrast, doubt exerts an *attenuating* influence on one's thoughts, reducing the impact of these primary cognitions. There might be circumstances, however, when a thought is cast in doubt, and individuals are motivated to behave in ways that restore the sense of confidence they would like to associate with that thought (for a review of these cases, see, Wichman & Hermann, in press; see also, Briñol et al., in press). The idea of compensating for doubt suggests that people sometimes try to correct for the doubts they do not want to have by engaging in behaviors associated with confidence. We argue that most of the time meta-cognitive doubt is

⁸ In addition to self-validation, Tormala et al. (2007) uncovered another mechanism relevant to understanding ease of retrieval effects in the most common paradigm in which people are asked to generate a high (difficult) or low (easy) number of cognitions in a given direction. Specifically, it was predicted and found that when it is difficult for people to generate the specific type of cognition requested, they are more likely to spontaneously generate unrequested cognitions, and the presence of these opposite-direction cognitions can play a mediating role in determining the judgments expressed.

likely to merely attenuate the use of primary cognition.⁹ However, when doubt is *threatening*, it might lead people to want to restore confidence. In a line of research designed to explore this idea, Horcajo et al. (2008b) asked participants to read a persuasive proposal composed of strong or weak arguments. After listing their thoughts toward the proposal, participants were assigned to either write about personal experiences of doubt (doubt induction), to complete a test of intelligence and receive false feedback of poor performance (threat induction), or to do both of these tasks sequentially (threatening doubt induction). Compared with participants in the normal doubt condition, participants in the other two conditions (threat and threatening doubt) reported wanting more confidence, and showed more reliance of their thoughts. These findings suggest that the same meta-cognitive doubt can decrease or increase the use of primary cognitions depending on the threat associated with that doubt.

We argue that one day-to-day situation in which people are engaged in intense threatening uncertainty occurs when thinking about one's inevitable death. In accord with this possibility, Terror Management Theory (TMT; Greenberg et al., 1986) postulates the idea of death leading people to counter their fear of death by creating and maintaining a cultural worldview, which gives meaning and order to the world. Consistent with this proposal, laboratory research has shown that reminders of death lead to more favorable evaluations of people who personify cultural values and to more negative evaluations of people who defy those values (e.g., see Greenberg et al., 1997; for a review). Our self-validation approach can shed some light on why MS leads to such polarized judgments. Specifically, we hypothesized that one way in which MS influences attitudes is by increasing threatening doubt (inducing the need for confidence), which, in turn, leads to reliance on one's own thoughts.

In order to test this novel prediction that MS-induced polarization can occur via self-validation, Horcajo et al. (in press) exposed participants to a printed vita of a job candidate containing either strong or weak attributes in support of the candidate. Attribute cogency was varied in this study to lead participants to generate mostly positive or negative thoughts toward the job candidate. After participants read the vita and wrote their cognitive

⁹ There might also be conditions and processes by which doubt does not just attenuate but actually *reverses* the effects of first-order cognition (cf. Briñol et al., in press). For example, if people have so much doubt about what they have in mind, they might decide to do the opposite of their thoughts. Some studies have provided some preliminary evidence in favor of the possibility that doubt can sometimes lead to such reverse effects (e.g., Briñol et al., 2007a). In particular, people might be especially likely to do the opposite of their thoughts when they doubt self-views that are represented or framed in a dichotomous manner (e.g., winner vs loser, extrovert vs introvert, smart vs dumb) than when those self-views are seen as more continuous (e.g., success, intelligence, age). Obviously, a large number of individual (e.g., dysfunctional use of dichotomous thinking, Beck & Greenberg, 1994) and situational (e.g., format of response) factors might influence these constructs, and therefore whether doubt merely attenuates or reverses primary cognition.

responses about it, MS was experimentally manipulated. Participants were asked to describe what they thought will happen when they die (MS induction), or to write about being cold (control). Finally, all participants reported their attitudes toward the candidate. In line with the self-validation hypothesis, we found that the effect of attribute cogency on attitudes toward the job candidate was greater under the MS than the control condition. Thus, MS participants relied on their thoughts more than control participants in forming attitudes to judge the candidate. Importantly, we established that the MS effects on attitudes were mediated by thought confidence, and occurred only among participants who reported greater elaboration. Across different manipulations of all the variables, this series of studies revealed that MS can influence attitude change by increasing the confidence with which people hold their own thoughts. Among other things, these findings are important because they provide an entirely unexplored mechanism (self-validation) for MS effects that are relevant for understanding persuasion.

8. MESSAGE EFFECTS THROUGH SELF-VALIDATION

Although there are numerous studies on aspects of a persuasive message that can determine its effectiveness (e.g., whether it emphasizes affect or cognition, presents many or few arguments, is complex or not), relatively few self-validation studies have examined message effects *per se*. Although we have examined some of these (e.g., message complexity can influence persuasion by reducing thought-confidence, cf. Petty & Briñol, 2002), we focus here on two current topics within the domain of persuasive messages—the effects of matching or tailoring the message to some characteristic of the message recipient (e.g., their personality, their identity, etc.; see Briñol & Petty, 2006; Petty et al., 2000), and the effects of a person's thoughts that match some aspect of the persuasive appeal.

8.1. Matching regulatory fit

One aspect of matching that has achieved considerable attention recently is the idea that matching a message or a process to a person's promotion or prevention regulatory style can produce a sense of regulatory "fit" (Higgins, 2000). As a result, when a message is matched to the person in this way (i.e., eager means of achieving some end combined with a promotion focus or vigilant means with prevention focus), the individual might come to accept the message position simply because the message "feels right" (Cesario et al., 2004) or is easier to process (e.g., Lee & Aaker, 2004). According to the ELM, these simple fluency experiences should influence attitudes in a simple way (e.g., as a heuristic, "if it fits it is good") primarily under

relatively low thinking conditions. Our interest here is that the experience of “fit” from matching can also serve a self-validation role when the likelihood of thinking is high (Tormala et al., 2002).

In one study on regulatory fit, Cesario et al. (2004) exposed participants to a persuasive message in favor of consuming more vegetables. The message either emphasized the accomplishment (promotion) or the safety (prevention) features of vegetable consumption. Additionally, within each regulatory focus condition, the message was either framed in terms of eager means (i.e., presence and absence of gain/no-gain information) or vigilant means (i.e., presence and absence of nonloss/loss information). When the promotion system was activated, there was more persuasion with eager means framing than vigilant means framing. The reverse occurred when the prevention system was activated. This interaction pattern is consistent with the self-validation framework if one assumes that participants generated mostly favorable thoughts. In another study in which both positive and negative thoughts were assessed, Cesario et al. (2004) report that the valence of one’s thoughts (favorable/unfavorable) had a greater impact on attitudes under conditions of regulatory fit than nonfit. This pattern fits predictions from the self-validation framework if regulatory fit enhanced thought confidence.

Future research on regulatory fit should examine whether other kinds of message matching can also produce self-validation effects by inducing a sense of feeling right. For example, additional research on regulatory fit has shown that fit (vs. nonfit) can increase motivation when one has a positive thought (e.g., “I feel like continuing”) or decrease it when the thought is opposite (e.g., “I have done all I can,” Ann Vaughn et al., 2006). This pattern also fits the self-validation framework if fit enhanced the impact of available thoughts by increasing confidence.

8.2. Thought matching

An interesting case of matching between the persuasive appeal and the message recipient has to do with the content of the thoughts generated by the target of persuasion. As described earlier in this review, prior work on self-validation has demonstrated that sources (e.g., credible and similar) can validate people’s thoughts regardless of the content and valence of the target’s thoughts. For example, high source credibility increased confidence in message recipients’ thoughts in response to strong messages and also in their counterarguments in response to weak messages (Tormala et al., 2006). Similarly, different recipient variables (e.g., emotion, power, head nodding) were shown to validate thoughts regardless of the content and valence of the target’s thoughts. For example, happiness increased confidence in favorable (positive) and unfavorable (negative) thoughts alike, and sadness reduced confidence in both kinds of thoughts (Briñol et al., 2007a). In all these

studies, the content of the thoughts did not matter for validation purposes because those thoughts were not directly related to the validating variable in that the thoughts were about some proposal (e.g., a new cell phone, comprehensive exams) rather than the validating variable itself (e.g., about the source of the message or one's emotional state).

However, it might be different when the content of the thoughts relates directly to the validating variable. For example, when a source serves as a validating cue, it might matter if the thoughts are about the source rather than a proposal the source is advocating. Imagine reading a message about some unidentified person that you suspect is a woman. If you then learn that the source is indeed a woman, your thoughts about the source would be validated whereas if you learned that the source was a man, your thoughts would be invalidated. In general, people are likely to have more confidence when the content of their thoughts matches or fits the nature of the source rather than when the content does not fit or mismatches. Thus, thought confidence might be increased if a person high in prejudice generated negative thoughts toward a job candidate and then learned that the candidate came from a stigmatized group with low performance expectations rather than from a nonstigmatized group with positive performance expectations. This suggests that sources with low (vs. high) status can affect judgments by validating (rather than invalidating) thoughts under some circumstances such as when the source is the object of the thoughts, and when thoughts are stereotypical or match the nature of the source.

In one study examining this idea (Clark et al., *in press*), participants received information about a student who performed either reasonably well or poorly on an intelligence test. The good information would lead people to have positive thoughts about the target's intelligence whereas the poor information would lead people to have negative thoughts about the target's intelligence (see Wegener et al., 2006). Following the information, participants listed their thoughts about the target and then learned that the target was either from a low SES (socioeconomic status) household or a high SES household. When the SES information matched the performance expectations (i.e., poor performance with low SES and high performance with high SES), participants had more confidence in their thoughts and used them more in making recommendations regarding the target's future education. Importantly, the obtained findings were mediated by thought-confidence (rather than thought content, and consistency-related measures).

8.3. Summary and additional message factors

The examples on matching described above suggest that the self-validation approach can operate not only for totally unrelated thoughts and validating variables, but also when the content of the thoughts (e.g., stereotypical or nonstereotypical) directly relate to the validating variable. Other aspects of

the thoughts can also match (or mismatch) the recipient, leading to an increase (or decrease) in confidence. For example, future research should examine whether the *position* advocated in a persuasive proposal can be seen as validating or invalidating information regarding one's own position, at least when highlighted *after* thinking about the persuasive proposal.



9. CONTEXT EFFECTS THROUGH SELF-VALIDATION

In the preceding sections we have described how source (e.g., credibility), recipient (e.g., emotions), and message (e.g., matching) variables can influence persuasion by affecting thought-confidence. Most of the time, variables affect confidence in a particular direction. For example, source credibility and positive emotions tend to signal high rather than low confidence. However, the meaning and the valence of particular variables can vary between individuals and situations. We argue that if the meaning of the variable with respect to confidence changes, the subsequent effects could also change (for an example of variations on the meaning of “fluency” see, Briñol et al., 2006). This implies that the same variable might increase or decrease certainty as a function of other variables, such as one's naïve theories of the meaning of that variable. For example, consider the case of *mental repetition*. Previous research has shown that repeating thoughts that are perceived as uncontrollable might lead to nonadaptive self-related consequences (by increasing rumination and uncontrollable intrusiveness), whereas repeating thoughts that are perceived as controllable might lead to more adaptive outcomes (by allowing strategies such as refocusing and reframing; Segerstrom et al., 2003). These findings suggest that repetition might increase or decrease certainty depending on various other factors such as the specific mental construct that is rehearsed.

In addition to the specific construct rehearsed, people's naïve theories about repetition are expected to moderate this phenomenon. For example, a few repetitions could enhance confidence in the repeated construct, but many repetitions might trigger doubt as continuing repetition might signal that something is wrong with the thought. This logic is similar to the findings observed in the literature on mere repeated exposure (e.g., Bornstein, 1989; Cacioppo & Petty, 1979; Zajonc, 1968) where initial repetition leads to positive results that turn negative. In a preliminary test of the later idea, Briñol et al. (2008) asked participants to list their positive or negative thoughts regarding a persuasive proposal, and to report their attitudes toward it. The number of times the thoughts were repeated (1, 3, 5, 7, 9, 11) was manipulated between subjects. As predicted, the results revealed a curvilinear effect of repetition on confidence with confidence first increasing and then decreasing with repetition. With very few

repetitions, repetition increased confidence, and people relied on their thoughts more when forming attitudes. However, after an early inflection point in the curve, the thought-confidence effect reversed. Specifically, asking participants to repeatedly write down the same thoughts reduced the perceived confidence in the thoughts as a basis for judgment. As a consequence of this reduction in thought-confidence following excessive repetition, persuasion either decreased (for positive thoughts) or increased (for negative thoughts). In line with the self-validation logic, this study revealed that the number of repetitions moderates the relation between repetition and confidence, therefore having opposite effects on persuasion.



10. EXTENDING SELF-VALIDATION IN PERSUASION

Our review has documented that the self-validation framework provides a new process by which many previously studied variables can operate in persuasion situations. We have focused our review on the effects of self-validation processes in traditional persuasion settings in which attitudes change with respect to particular issues and objects following presentation of a message. Having demonstrated that some classic persuasion variables such as source credibility and a recipient's emotion can determine the extent of influence by affecting thought confidence, we have started to examine whether other classic phenomena in the attitude change literature can similarly benefit from a consideration of self-validation processes. We next describe how self-validation can provide a novel framework for understanding persuasion in two essential additional domains: attitudinal ambivalence and self-related phenomenon.

10.1. Ambivalence

Although we generally think of attitudes as being positive or negative, some attitudes are characterized as being *ambivalent* in that the attitude object is associated with both positive and negative features rather than being one-sided or univalent (e.g., Kaplan, 1972). People typically report feeling conflicted when they endorse both positive and negative aspects of the same attitude object. Understanding ambivalence is important as it can prevent people from changing undesired behaviors (e.g., smoking) into desired ones. Ambivalence can emerge from multiple sources (e.g., Priester & Petty, 2001; Thompson et al., 1995; see, Petty & Briñol, 2009), and has been associated with important consequences, such as enhanced scrutiny of the information in a persuasive message (Briñol et al., 2006; Maio et al., 1996; Petty et al., 2006), especially when that processing holds the promise of reducing the ambivalence (Clark et al., 2008).

In accord with the self-validation framework, DeMarree et al. (2008b) conducted some initial studies to examine the extent to which differential confidence in the positive or negative aspects of the attitude object contribute to the experience of ambivalence. To date, one puzzle is that consideration of the positive and negative features of an attitude object allows just a moderate prediction of the extent of subjective ambivalence (Priester & Petty, 1996; Thompson et al., 1995). This prediction can be improved by considering the extent to which the positive and negative aspects of an attitude object are simultaneously accessible (Newby-Clark et al., 2002). Furthermore, the self-validation approach suggests that prediction can be further improved by considering the confidence people have in the positive and negative aspects of an attitude. For example, by making people doubt one side of their reactions, the overall sense of ambivalence can be reduced. Conversely, by enhancing confidence in both positive and negative associations, the sense of ambivalence could be magnified. Thus, paradoxically, selectively instilling doubt might potentially lead to enhanced overall confidence, and instilling confidence in both sides would lead to more overall doubt.

In one of the studies conducted to examine this idea, participants were asked to generate both positive and negative thoughts regarding an attitude object. As one might expect, this mixed pattern of thoughts produced both objective and subjective ambivalence. After measuring how conflicted people felt, we manipulated the confidence associated with just one side of those mixed thoughts or both sides. Specifically, in one condition we provided participants with false feedback leading them to believe that only one half of their thoughts were shared and endorsed by other students, whereas the other half was rejected. In another condition, participants received false feedback suggesting agreement or disagreement with both sides. As described earlier, this social consensus induction has been previously found to influence thought-confidence in a paradigm in which participants' thoughts were polarized in just one direction (Petty et al., 2002, experiment 4). As expected from the self-validation logic, instilling doubt (in one side of the thoughts), paradoxically, led to overall confidence in the attitude, and instilling confidence (in both positive and negative associations) was associated with more doubt in one's overall position.

In addition to measuring confidence and ambivalence, in subsequent studies in this series, we assessed the potential consequences for persuasion by giving people the opportunity to receive different messages related to the attitude object, and assessing their reactions to them. In line with the self-validation logic outlined above, we found confidence (or doubt) associated with just one side of the thoughts (positive or negative) reduced ambivalence, and therefore undermined the need for information processing associated with the attitude object. Conversely, confidence associated

with both sides of the attitude object was shown to increase ambivalence, and enhance subsequent information processing of a relevant persuasive message.¹⁰

This line of work provides an important advance because all the work conducted so far on self-validation has examined the effects of confidence/doubt on all the thoughts that an individual has available at the time. Here, however, we focus on differential confidence in part of one's thoughts. The present line of work also has the potential to provide an important addition to prior work on ambivalence in suggesting a novel approach to reduce the conflict and thus the negative consequences that sometimes follow from ambivalence.

10.2. Personal relevance

In most of the persuasion literature, the self has been studied as a variable relevant at the primary level of cognition. For example, when motivation and ability to think are relatively low, merely linking an attitude object to the self can increase liking of it, assuming that people hold themselves in high regard (e.g., Kahneman et al., 1991; see also Greenwald et al., 2002; Gawronski et al., 2009). If thinking is not constrained to be high or low, however, then increasing self relevance before a persuasive message influences the amount of thinking about the message, increasing the effect of argument quality on attitude change (Petty & Cacioppo, 1979; see also Petty & Wegener, 1998).

However, as is the case with any variable, the self can be also relevant at other levels of cognition, operating through a variety of processes (for a review, see, e.g., Briñol et al., in press). Thus, when thinking is already constrained to be high and the self relevance follows message processing, a link to the self can serve a validation role. In one study exploring this idea, Petty and Briñol (2008c) first asked participants to read either strong or weak messages in favor of comprehensive exams. This manipulation led participants to generate either positive or negative thoughts toward the proposed policy. Importantly, those thoughts were *subsequently* made more or less self-relevant by asking participants to think either about the self-relevance or the general implications of the policy. Consistent with the self-validation notion, the thoughts generated regarding the proposal had a greater impact on attitudes when they were made self-relevant than when they were not. Among other things, this research reveals that self-validation can account for an already well-established persuasion outcome (e.g., a greater argument quality effect under high- vs low- personal relevance),

¹⁰ This suggests that differential confidence in the two sides of an issue decreases ambivalence.

but by a different process than postulated previously (through thought confidence vs amount of thoughts). This work also specifies the conditions under which each process is more likely to operate. That is, self relevance introduced before the message influences the amount of thinking (Petty & Cacioppo, 1979), whereas self relevance induced after the message affects thought-confidence.

In the above line of research thoughts were linked to the self by asking participants to think about the self-relevance of the policy. There are other ways to link thoughts to the self, and thus increase self-relevance. For example, a self-link can be created by making the outcomes relevant to the self (vs. others). Another approach relies on making the self (vs. others) the origin of the thoughts. The perceived origin of the thoughts is an important dimension of meta-cognition (Petty et al., 2007). In one of the studies examining the perceived origin of one's thoughts, Briñol et al. (2008a) asked participants to generate positive or negative thoughts regarding their bodies. Then, participants were led to believe that their thoughts were originated externally (by an external source) or internally (by the self). Specifically, thoughts about the body were said to emerge from the particular views of their culture through socialization (external origin) or to emerge from deep down inside of the self. Because participants had more confidence in their thoughts in the later than in the former condition, the direction of their thoughts generated had a greater impact on how satisfied they felt with their bodies when the origin of the those thoughts was perceived to be the self rather than an external source. As a result, perceiving positive thoughts to come from the self (vs. others) made people feel better about their body image, but produced the opposite effect for those with negative thoughts.

In another study in this line of research, we replicated these findings for attitudes toward fast food. Specifically, after thinking about the benefits or costs of eating fast food, participants were led to believe that food-related thoughts were learned from others (external source) or were innate (internal source). As expected, the direction of the thoughts (positive or negative) had a greater impact on the attitudes and behavioral intentions regarding eating fast food when people perceived the self (vs. others) as the source of the thoughts.



11. CONFIDENCE APPLIED TO CONFIDENCE: A SELF-VALIDATION ANALYSIS

We have described how the thought-confidence induced by source, message, recipient, and context variables can influence persuasion. Our review on the effects of self-validation processes has also examined some

cases in which these variables influenced not only thoughts in response to a persuasive proposal, but also other kinds of cognitions such as self-related thoughts or thoughts about other people. Thus, research on self-validation suggests that confidence can also be applied to any primary cognition. As mentioned earlier, the self-validation view argues that meta-cognitive confidence can magnify the effect of any content that is currently available in people's minds, including not only the different kinds of thoughts reviewed so far, but also other cognitions. That is, confidence applies to whatever the salient or available mental contents are at the time.

Given that meta-cognitive confidence can be applied to any cognition, an interesting case to examine would be when people have confidence (or doubt) in their own confidence or doubt. Especially interesting would be the case in which people doubt their own doubts. That is, doubt can be the content of primary cognition, and therefore people can vary in the extent to which they have confidence or doubt in the original self-doubt (i.e., second order cognition). For example, consider a person who suffers from chronic self-doubt which is typically conceptualized and measured as a belief about oneself (e.g., "*I am an insecure person*"; Oleson et al., 2000). If people with chronic doubt are given a situational induction of certainty, they might apply this sense of confidence to the chronic doubt which would further reinforce the doubt (e.g., "*I'm confident that I am an insecure person*"). On the other hand, if people with the same chronic doubt were given a situational induction of doubt, they might apply this doubt to the accessible chronic doubt, which could lead to the opposite conclusion (e.g., "*I'm not confident that I am insecure; therefore, I might be a secure person*"). If these processes occur, then a person with chronic doubt who was given a doubt induction would feel more certainty than a person with the same chronic doubt who was given a certainty induction. This prediction stands in stark contrast to what would be predicted from an additive combination of chronic and state uncertainty, in which cases of "double doubt" would be associated with extreme uncertainty.

These predictions were examined in a series of studies in which doubt was present at both the level of primary and secondary cognition. Indeed, a traditional perspective on the accessibility of doubt holds that multiple sources of doubt activation should lead to increased levels of uncertainty (e.g., Bargh et al., 1986; Srull & Wyer, 1980). In contrast, we proposed and found that under some conditions two sequential sources of doubt activation result in *decreased* levels of uncertainty. In one study about doubting your own doubt (Wichman et al., 2008), participants were first primed with doubt or certainty and then exposed to a manipulation associated with either confidence (e.g., head nodding) or doubt (head shaking; see Briñol & Petty, 2003). Supporting the idea that people can either trust or doubt their own doubts, head nodding (vs. shaking) accentuated (vs. attenuated) the impact of the initial doubt versus certainty manipulation (see Fig. 2.8).

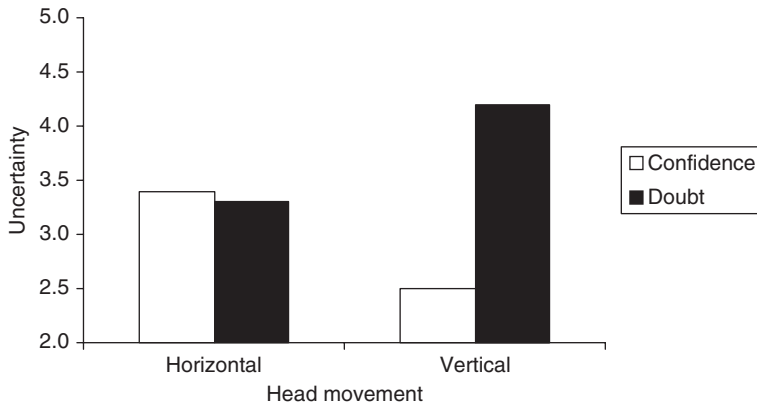


Figure 2.8 Uncertainty as a function of head movements and initial confidence or doubt. Adapted from Wichman et al. (2008, Experiment 2).

This meta-cognitive idea that doubt following doubt can undermine doubt (i.e., doubt + doubt = confidence) has important implications for persuasion. For example, in one study Wichman et al. (2008, cf. Briñol et al., in press) manipulated the extent to which participants relied on their own doubt as measured with the self-doubt scale (Oleson et al., 2000). To test the processing implications of double doubt, a sample of high self-doubt individuals was randomly assigned to either a doubt priming or neutral priming condition. Thus, half the participants were essentially placed in a state of single-doubt (high chronic self-doubt with the neutral prime) and half were placed in a state of double-doubt (high chronic self-doubt with the doubt prime). Then, participants were randomly assigned to receive strong or weak arguments in favor of a foster care program. The gist of a strong argument in favor of the foster program was that brothers and sisters are an additional source of love and support for the social development of the child. In contrast, the gist of a weak argument in favor of the foster program was that the program recognizes that children need other children to fight with, and brothers and sisters provide an ideal opportunity for this to occur. As noted, considerable prior research has shown that when people are either unable or unmotivated to process a message, the impact of the quality of the arguments on judgment is less than when thinking is high (Petty & Cacioppo, 1986). Based on previous literature on uncertainty and message processing (e.g., Briñol et al., 2006; Petty et al., 2006; Tiedens & Linton, 2001; Weary & Edwards, 1997), those in a state of single-doubt were expected to process information more carefully and therefore to discriminate between weak and strong persuasive arguments more so than individuals experiencing double doubt. This is because double doubt should lead to *less* uncertainty. Consistent with this reasoning the results revealed that conditions associated with single doubt (e.g., high chronic self-doubt with the neutral prime) produced

greater information processing (i.e., more argument quality effects) than conditions associated with double-doubt (e.g., high chronic self-doubt with the doubt prime).

This study reveals that people's primary beliefs about themselves (low vs high doubt) can be qualified by a situational uncertainty induction in a way consistent with the meta-cognitive logic, and that the results of double doubt are consequential for information processing and persuasion. As noted, this line of research is also consistent with the idea that meta-cognitive confidence (and doubt) can be associated with any type of cognition, including one's own doubts.



12. SELF-VALIDATION EFFECTS BEYOND THE PERSUASION CONTEXT

The research described in this review illustrates that self-validation can provide a useful framework for understanding how a wide variety of cognitions can be validated (or invalidated) by a diverse set of variables. Whether the manipulations involved source credibility, bodily responses of the recipient, message matching, or thought repetition, and whether the cognitions were about a persuasive proposal or had contents of a different nature, self-validation effects were apparent suggesting that people often look for ways to validate whatever mental contents have been activated. People can even have confidence (or doubt) in the validity of their own confidence (or doubt), and self-validation can explain those cases of double doubt leading to certainty. After having described how confidence can be applied to mental contents relevant for persuasion, next we briefly mention how confidence applies to whatever people have in mind, including emotions and other primed constructs.

12.1. Emotions

We have already explained how emotions can validate cognitions. We also argue that one's emotion-relevant thoughts can be validated or invalidated thereby affecting a person's emotional experience. In a test of the idea that emotion-relevant cognitions can be validated, Rucker et al. (2008a) used an ease of retrieval manipulation to induce a sense of confidence or doubt in one's thoughts. In one study, participants were asked to write about either a few (easy) or many (difficult) happy events from the last year. When generating happy experiences was easy, people had more confidence in these experiences and this led to greater reports of happiness than when generating these experiences was difficult. In another study, participants were asked to write about happy or sad experiences with either their

dominant or nondominant hand. Writing emotional experiences with the dominant hand should lead to greater confidence in the experiences and greater emotional feelings than when writing with the nondominant hand (Briñol & Petty, 2003). In accord with this assumption, writing about emotional experiences with the dominant hand led to a larger biasing impact of the activated emotion on subsequent judgments of the likelihood of irrelevant emotional events than writing with the nondominant hand.

These studies revealed that emotional thoughts can be affected by meta-cognitive confidence, thereby influencing the emotion experienced. Given the prominent role of emotions in persuasion (for a review, see Petty et al., 2003), understanding all the ways in which thoughts are validated by emotions and emotional thoughts are validated (Briñol et al., 2006) seems to be a very fruitful avenue for future research.

It is important to note that the research described above focused on how the confidence associated with one's thoughts affected the experience of emotions. Other research has examined how, after people have already experienced an emotion, confidence can affect whether the emotion is used in subsequent judgments (e.g., Gasper & Bramesfeld, 2005). For example, Pham (2004) found that manipulating people's trust in their feelings affected whether people used their emotions in subsequent judgments. This finding is analogous to work on attitude-behavior consistency whereby people trust equivalent attitudes differentially when they are held with different degrees of confidence (e.g., Fazio & Zanna, 1978; Rucker et al., 2008b). In our self-validation research, however, confidence did not affect trust and use of the emotion, but rather confidence in emotion-relevant thoughts led to different perceptions of the extent of the emotion itself. This difference suggests that confidence can have multiple and independent effects both on assessing one's degree of emotion (as in the research by Rucker et al., 2008a) and in determining whether to use one's emotion (as in the research by Pham and others).

12.2. Priming

One of the most intriguing areas of research in recent years has concerned how subtle primes of various sorts (e.g., stereotypes, goals, etc.), can affect judgments and behavior (e.g., Higgins, 1996). In one study examining self-validation processes in this domain, DeMarree et al. (2008b) subliminally primed participants with words related to the Black (vs. White) stereotype. Following this induction, participants were instructed to use their heads to follow a ball moving vertically or horizontally on the screen. Consistent with the self-validation logic for vertical versus horizontal head movements, we found that the direction of the prime affected participants' felt aggression on an implicit measure as well as their deliberative ratings of closeness to African-Americans in the head nodding but not the head shaking condition.

Thus, as was the case with head nodding affecting confidence in thoughts to a persuasive message (Briñol & Petty, 2003), so too did head nodding appear to affect the validity and use of subtly activated mental content via priming.

In another experiment of this series, participants subliminally primed with the concept of resistance (vs. persuasion), showed more resistance to subsequent persuasive proposals. However, this only occurred when participants were nodding (compared with shaking) their heads immediately following the priming induction. In still other studies on priming we activated a goal followed by a validation manipulation (DeMarree et al., 2008a) and in each case the behavioral effects of the goal were more evident when the goal priming was followed by a confidence rather than a doubt induction. As was the case with emotional thoughts, our studies on priming provide several key advances other than extending the range of mental contents that are subject to meta-cognitive influence. For example, this research shed light on the study of self-regulation by testing whether the kind of validating variables described in this review (such as nodding, power, emotion) can be associated with either impulse (e.g., spending more money and engaging in more risky behaviors) or control (e.g., spending less money and engaging in less risky behaviors) depending on the direction of the primed goals that confident people (e.g., power holders, people nodding) have in mind. One of the ironic implications of the self-validation process is that highly confident people (e.g., high power individuals) might sometimes engage in less action than their low confidence partners (e.g., low power individuals) depending on the salient mental contents available.



13. MULTIPLE ROLES OF CONFIDENCE

Before closing this review, it is important to note that although we have focused on the validating role for confidence, like other variables, confidence can play different roles in information processing and judgment depending on the circumstances. As noted earlier, examining the validity of thoughts is a form of meta-cognition, and therefore it requires high thinking conditions (Petty et al., 2007). Indeed, research on the self-validation hypothesis has demonstrated that this mechanism requires a level of elaboration that is sufficiently high for individuals to both generate thoughts, and to care about their validity.

Under other circumstances, however, confidence can affect judgment by alternative mechanisms. In accord with the ELM, confidence, like any other variable, can affect judgments not only by validating thoughts, but also

by affecting the direction and amount of thoughts, and by serving as an argument or a simple cue.¹¹ We briefly describe these roles next.

First, when thinking is low, confidence should serve as a simple associative cue and produce judgments consistent with its valence. Given that confidence is often seen as something good, and doubt as something bad (e.g., Briñol et al., 2006), confidence can operate through low effort mechanisms, such as serving as input to a confidence heuristic. For example, when the extent of thinking is low, a person might draw direct inferences from confidence, such as “if I feel confident, I must like it.”

Second, when thinking is high, confidence can serve in other roles. First, confidence can be evaluated as evidence when it provides diagnostic information about the merits of an object. For example, one’s own confidence can be evaluated as evidence when deciding whether to apply for high (vs. low) competitive jobs. Also, when thinking is high, confidence can bias thoughts in a positive manner, again assuming that confidence is positively valenced. If people are thinking about themselves, confidence is likely to make the self-thoughts generated more positive than they would be in the absence of such confidence. In such cases, confidence (relative to doubt) would be likely to increase self-evaluations by biasing the self-thoughts that come to mind. As a consequence of this unrealistic optimism, even when engaged in careful and detailed thinking, confidence can lead people to overestimate their skills and underestimate their own faults.¹²

When people are thinking about things other than themselves, such as a persuasive proposal, self-confidence could sometimes result in negative outcomes. That is, when thinking about a proposal is high, confidence (vs. doubt) can lead people to defend their own existing attitudes more, and as a consequence, generate more counter-arguments against the proposal or derogate the source.

Third, when elaboration is not constrained to be high or low, confidence has been shown to affect the extent of information processing, with confident people engaging in less thought than people lacking in confidence (e.g., Briñol et al., 2006; Petty et al., 2006; Tiedens & Linton, 2001; Weary & Edwards, 1997). One reason for this is that when people feel confident in their current views, there is little need to seek additional information that might lead to change. In contrast, when people lack confidence, they are

¹¹ Although there might be other processes relevant to understanding how confidence operates, we focus on this particular set of processes articulated by the ELM because they have been the most fruitful way to account for how many variables other than confidence can affect judgment (see, Petty & Briñol, 2006, for a discussion). Thus, we consider that each of these processes can be applied to social judgment more broadly.

¹² Also under high thinking conditions, if confidence was made salient and people perceived it as a possible biasing factor, they might attempt to correct their judgments for the perceived contaminating impact of their own confidence (Wegener & Petty, 1997).

likely to seek out and carefully scrutinize information that might provide a more validated opinion. Consistent with predictions, as noted earlier, when confidence has been induced prior to message exposure, and elaboration was not constrained to be high or low, confidence (whether stemming from power, emotion, or other factors) affected the extent of information processing, with confident people engaging in less thought than people lacking in confidence (e.g., Briñol et al., 2007b,c). Also consistent with this view, other forms of doubt (stemming from a variety of self-discrepancies, such as explicit–implicit conflict) have been found to increase information processing (see Petty & Briñol, 2009, for a review).

In sum, the ELM has described a finite number of ways in which any variable can affect judgment. In accord with this framework, we have described in this section how confidence can operate by: (1) serving as a simple cue, (2) serving as a piece of substantive evidence (i.e., an argument), (3) affecting the direction of processing (i.e., introducing a bias to the ongoing thinking), and (4) affecting the extent of information processing by influencing motivation or ability to think. In this review, we focused on a fifth mechanism through which confidence (whether stemming from emotion, bodily movements, or credible sources) can work, self-validation, which also appears to have considerable integrative potential.



14. FINAL REMARKS

We have described the basic mechanisms by which confidence can affect attitudes and persuasion, highlighting the role of a recently discovered process, *self-validation*. In this final section, we describe some remaining issues relevant to confidence and its influence on social judgments. First, although self-validation focuses on confidence as the main meta-cognitive dimension, it is important to note that other meta-cognitive aspects can be also explored in relation to thoughts. For example, it is well-established that thoughts and mental constructs that are highly accessible are more consequential in terms of durability and subsequent impact than less accessible thoughts (e.g., DeMarree et al., 2007). Although accessibility and other features of thoughts (e.g., importance) are often related to confidence, they are relatively independent features of cognition (for a review, see, Petty et al., 2007). In this review, we also have differentiated between confidence and other previously studied dimensions, such as desirability, likelihood, and diagnosticity.

Second, in the present review, we have emphasized relatively transitory situational (e.g., source credibility) and individual (e.g., body postures, ease) factors that can influence thought confidence. In addition to these situational determinants of thought confidence, there also are dispositional determinants of the use of mental contents. As described, individual differences in the

operation of meta-cognitive processes such as self-validation have been identified previously (e.g., need for cognition). Furthermore, we have recently examined chronic individual differences in the use of mental contents.

In particular, we found that attitudes were more in line with participants' thoughts when participants were high rather than low in self-confidence. Specifically, across several studies, DeMarree et al. (2008a) showed that increases in self-confidence (measured as self-esteem certainty, attitude certainty, self-attributes certainty, trait self-confidence, and judgmental confidence) were associated with increased use of mental contents. As self-confidence increased, participants' attitudes became more congruent with their thoughts. Results held across different thought inductions, and after controlling for self-esteem and other related constructs. Furthermore, as expected from a self-validation approach, these findings were moderated by amount of elaboration (i.e., only occurred among individuals engaging in effortful thought) and mediated by thought-confidence. This line of research provides a more complete understanding of the diverse nature of the determinants of thought confidence.

Finally, one might wonder whether many of the self-validation effects are due to the manner in which a variable (e.g., source credibility, recipient power, nodding, or positive mood) amplifies thought-confidence or how that variable (e.g., low credibility) diminishes confidence in thoughts. Without a control group it can be difficult to know whether the reviewed effects on thought-confidence resulted from validation or invalidation of thoughts. We argue that even though having a control group can allow for more precise statements, ultimately it is not necessarily critical for our contribution. That is, although we have found that, for example, both happy and sad emotions are each capable of producing a difference from a neutral mood control group (Briñol et al., 2007a, experiment 4), whether positive or negative emotions would always have greater impact over a neutral mood group would depend on many background factors. For example, if we used a persuasion topic for which people had high knowledge, the default level of thought confidence should be relatively high making the sad (low confidence) group more likely to differ from the control. On the other hand, if knowledge of the topic was low (i.e., it was unfamiliar), default (control) thought confidence would likely be low leading the happy condition to show the greater difference from the control. Given that in any one study other background factors would also come into play by affecting the default level of confidence, reading too much into the control group in any one study is potentially misleading if people view a control group in a particular context to imply a bidirectional effect that will be equivalent in magnitude across different issues, people, and situations. In the real world, the background level of confidence would vary dramatically from situation to situation and thus whether the "action" would be in the confidence or doubt condition would vary with these real world background factors.



15. SUMMARY AND CONCLUSION

In this article we have argued that although persuasion is complex, it can be understood by breaking the processes responsible for attitude change into a finite set as articulated by the elaboration likelihood model of persuasion. By focusing on underlying mechanisms, we now know that the extent and nature of a person's thoughts to external information are often more important than the information itself, and that the thoughts people generate only determinate judgments to the extent that people have confidence in them. Thus, in each of the studies reviewed, we showed that not only does the content of what is activated matter (e.g., thoughts in response to a persuasive proposal), but so too does the perceived sense of confidence in one's mental contents. Whether the validating manipulations involve power or head nodding, or whether the primary cognitions are about persuasive proposals, or oneself, or are emotional or rational in nature, the self-validation logic suggests that people sometimes look for ways to validate whatever mental contents have been activated. Together, these studies illustrate that self-validation can provide a useful framework for understanding how a wide variety of cognitions can influence (or not) judgment and behavior by being validated (or invalidated) by a diverse set of variables.

We have examined how self-validation not only relates to some classic topics in the psychology of the source of persuasion (e.g., credibility, similarity), the message (e.g., matching), the recipient (e.g., bodily responses, emotions, self-affirmation, power, and ease of retrieval), and the context of persuasion (e.g., social consensus, repetition) but also to more recent, or relatively novel phenomenon (e.g., oneself as a source, self vs other origin of thoughts). Furthermore, self-validation processes have shed light on a variety of phenomenon relevant to attitude change from a meta-cognitive perspective, such as attitudinal ambivalence and self-relevance.

Research on self-validation has shown that this new mechanism can account for some already established persuasion outcomes (e.g., more persuasion with happy than sad mood, with high than low credibility sources, when argument generation is easy rather than difficult, when nodding rather than shaking one's head), but by a different process than postulated previously. Moreover, we have been also able to obtain findings opposite to those typically observed (e.g., more persuasion when shaking than nodding or for low than high credible sources). Thus, a consideration of self-validation processes might expand our understanding of the dynamics of other unexplored variables that could influence persuasion either by increasing (e.g., visualization) or decreasing (e.g., negation) thought-confidence.

In closing, it is worth noting that research conducted on self-validation has examined the effect of thought confidence with regard to a variety of attitude objects, ranging from consumer products (e.g., cell phones) to health policies (e.g., mandatory vaccinations), to social issues (e.g., foster care programs), to the self (oneself as a job candidate). The use of a wide variety of topics, including some that are relatively important to our participants (e.g., a change in crucial university policies), increase the potential applicability of the self-validation process. Furthermore, the obtained findings on different dependent measures support the notion that the current results have real-world implications.

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ACTION-BASED MODEL OF DISSONANCE: A REVIEW, INTEGRATION, AND EXPANSION OF CONCEPTIONS OF COGNITIVE CONFLICT

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Abstract

An action-based model of dissonance is presented. This model accepts the original theory's proposal that a sufficient cognitive inconsistency causes the negative affective state of dissonance. It extends the original theory by proposing *why* cognitive inconsistency prompts dissonance and dissonance reduction. After reviewing past theoretical and empirical developments on cognitive dissonance theory, we describe the action-based model and present results from behavioral and physiological experiments that have tested predictions derived from this model. In particular, this evidence converges with recent neuroscience evidence in suggesting that the anterior cingulate cortex and left prefrontal cortical region are involved in conflict detection and resolution, respectively. We end by reviewing research on individual differences in dissonance arousal and reduction, and present a new measure designed to assess these individual differences.



1. OVERVIEW OF THE CHAPTER

Cognitive dissonance theory, first proposed by Festinger (1957), has generated hundreds of experiments and is considered one of the most influential theories in psychology (Jones, 1985). The theory and the research it has inspired have led to an increased understanding of attitude and behavior change processes, as well as an understanding of the relationships between cognition, perception, emotion, and motivation. In this article, we present the core ideas behind Festinger's original theoretical statement and discuss some notable attempts by researchers to revise and extend the basic theory. We then describe a more recent theoretical conceptualization of dissonance, referred to as an *action-based model*, which provides an overarching framework for understanding dissonance processes, and for integrating a wide range of data and previous theoretical revisions to Festinger's theory.

Briefly stated, the action-based model begins with the assumption that many perceptions and cognitions serve to activate action tendencies with little or no conscious deliberation. This assumption is consistent with several perspectives in psychological science, such as William James' (1890) ideomotor conception, Gibson's (1966, 1979) ecological approach to perception, and subsequent elaborations of these basic ideas (Berkowitz, 1984; Dijksterhuis & Bargh, 2001; Fiske, 1992; McArthur & Baron, 1983; Smith & Semin, 2004). The action-based model goes further to suggest that when these "cognitions" with action implications come into conflict, a negative affective state is aroused, referred to as *dissonance*. Our model posits that dissonance affect is aroused because conflicting action-based cognitions have

the potential to interfere with effective action. The organism is motivated to reduce this negative affect and ultimately reduce the “cognitive inconsistency” in order to behave effectively. This way of conceptualizing dissonance processes addresses many problems with past theories concerned with dissonance. It also suggests a broad organizing framework for integrating and understanding a wide array of other nondissonance theories and research.



2. OVERVIEW OF THE THEORY OF COGNITIVE DISSONANCE

The original theory of cognitive dissonance predicted that when an individual holds two or more elements of knowledge that are relevant to each other but inconsistent with one another, a state of discomfort is created. This unpleasant state is referred to as “dissonance.” According to the theory, the magnitude of dissonance in relation to a cognition can be formulated as equal to $D/D + C$, where D is the sum of cognitions dissonant with a particular cognition and C is the sum of cognitions consonant with that same particular cognition, with each cognition weighted for importance (see Sakai, 1999; Shultz & Lepper, 1999, for precise mathematical models).

According to the original theory, the unpleasant state of dissonance motivates individuals to engage in psychological work in an effort to reduce the inconsistency between cognitions. Festinger (1957, p. 3) wrote, “The existence of dissonance, being psychologically uncomfortable, will motivate the person to try to reduce the dissonance and achieve consonance.” So, if a dieter consumed a fattening meal, he would likely be in a state of dissonance. Assuming that he stays committed to the diet, the theory would predict that he will reduce dissonance by adding consonant cognitions (e.g., “the diet will improve my appearance”), subtracting dissonant cognitions (e.g., “fattening foods are not very tasty”), increasing the importance of consonant cognitions (e.g., “my health is the most important thing in life”), or decreasing the importance of dissonant cognitions (e.g., “sensory pleasures are not very important”).

Researchers have most often measured dissonance reduction with attitude change. Attitude change in response to a state of dissonance is expected to be in the direction of the cognition that is most resistant to change. In laboratory tests of the theory, knowledge about recent behavior is usually assumed to be the cognition most resistant to change. If one has recently performed a behavior, it is usually difficult to convince oneself that the behavior did not occur. Thus, attitudes often change to become more consistent with a recent behavioral commitment.

2.1. Experimental paradigms used to test dissonance theory

Three experimental paradigms constitute the majority of tests of dissonance theory. Each paradigm induces participants to experience an inconsistency between cognitions and then gives them an opportunity to express a change in attitudes. The change in attitudes is measured, and is presumed to reflect the degree of dissonance reduction. In this section, we describe the basic logic behind each of these paradigms to provide the reader with a basis for evaluating much of the research conducted on dissonance over the past half century.

2.1.1. Free choice

After a decision between alternatives, all of the cognitions that favor the chosen alternative are consonant with the decision, whereas all the cognitions that favor the rejected alternative are dissonant. An individual's experience of dissonance is greater when the number and importance of dissonant cognitions is higher, and/or when the number and importance of consonant cognitions is lower. The dissonance an individual experiences is typically greater after choosing between alternatives that are closer in attractiveness (as long as each alternative has several distinguishing characteristics). Dissonance caused by a decision can be reduced by viewing the chosen alternative as more attractive and/or viewing the rejected alternative as less attractive. Brehm (1956) conducted the first free choice experiment. In it, participants made either an easy or a difficult decision between two alternatives (i.e., household objects such as an automatic toaster and a fluorescent desk lamp). The difficult decision was one in which the alternatives were close in attractiveness, whereas the easy decision was one in which the two alternatives were very different in their attractiveness (i.e., one alternative was much more attractive than the other). Participants were asked to evaluate each of the alternatives before and after their decision to choose one of the alternatives. After an easy decision, attitudes toward the alternatives did not change. In contrast, after a difficult decision, attitudes toward the alternatives changed, such that they became more negative toward the rejected alternative (and slightly more positive toward the chosen alternative). This method of reducing dissonance by changing one's attitudes toward the two choice options to be more consistent with a decision has been referred to as "spreading of alternatives."

2.1.2. Induced compliance

Dissonance should also be aroused when a person acts in a way that is contrary to his or her attitudes, because the recent behavior is inconsistent with one's preexisting attitude. But how can an experimenter unobtrusively induce a research participant to perform such an act? In the first test of this prediction, Festinger and Carlsmith (1959) had participants perform a boring task that involved turning a series of wooden pegs. After completing

this very tedious task, participants were paid either \$1 or \$20 to tell “another participant” that the task was interesting. Festinger and Carlsmith reasoned that lying for a payment of \$20 should not arouse much dissonance, because \$20 provides sufficient justification for the counterattitudinal behavior (i.e., it adds cognitions consonant with the behavior). By comparison, being paid \$1 for performing the same behavior should arouse much dissonance, because \$1 was just enough justification for the behavior (i.e., it adds fewer consonant cognitions than \$20). As expected, participants in the \$1 (low-justification) condition changed their attitudes to be more positive toward the task, whereas participants in the \$20 (high-justification) condition did not change their attitudes. Thus, this paradigm was successful in arousing dissonance and motivating dissonance-reducing attitude change.

2.1.3. Effort justification

Dissonance is aroused whenever a person engages in an unpleasant activity to obtain some desirable outcome. From the cognition that the activity is unpleasant, it follows that one would not engage in the activity. In other words, the cognition that the activity is unpleasant is dissonant with engaging in the activity. As an individual puts increasing effort into an unpleasant activity, the dissonance he or she feels as a result of the activity should increase. Dissonance can be reduced by changing one’s view of the outcome to be even more desirable (a means for adding consonant cognitions).

In the first experiment designed to test these theoretical ideas, Aronson and Mills (1959) had women undergo a severe or mild “initiation” to become a member of a group. In the severe initiation condition, the women engaged in an embarrassing activity to join the group, whereas in the mild initiation condition, the women engaged in an activity that was not very embarrassing to join the group. The group turned out to be rather dull and boring. The women in the severe initiation condition evaluated the group more favorably than the women in the mild initiation condition.

The above paradigms continue to be used fruitfully in research (e.g., Beauvois & Joule, 1996; Cooper, 2007; Harmon-Jones & Mills, 1999; Olson & Stone, 2005). Other experimental paradigms have been used to test the theory but they are used less frequently and because of space limitations are not described here (Wicklund & Brehm, 1976).

2.2. Alternative theoretical explanations

After these and other dissonance results appeared, some theorists began to question whether the results were due to motivational processes. These theorists suggested that attitude change was due to cold, purely cognitive processes such as self-perception (Bem, 1967) or to managing one’s impression to others (Tedeschi et al., 1971). However, subsequent research confirmed that dissonance is best characterized as a motivated process (for

reviews, Harmon-Jones, 2000a,b). For example, individuals experiencing the state of dissonance have been found to exhibit heightened electrodermal activity (which is associated with activation of the sympathetic nervous system; Elkin & Leippe, 1986; Harmon-Jones et al., Simon & Nelson, 1996) and report increased negative affect (e.g., Elliot & Devine, 1994; Harmon-Jones, 2000c; Zanna & Cooper, 1974). After cognitive discrepancy is reduced (i.e., attitude change occurs), self-reported negative affect is reduced (Elliot & Devine, 1994; Harmon-Jones, 2000c). Moreover, research using a misattribution paradigm reveals that discrepancy reduction is motivated by the need to reduce negative affect (Zanna & Cooper, 1974). Thus, this research showing that negative affect occurs as a result of cognitive dissonance and that it creates a motivation to engage in dissonance-reducing activities strongly suggests that the dissonance process is a motivated one.

Beginning in the late 1960s, researchers began to propose motivational explanations for dissonance effects that differed from Festinger's originally proposed theory. Whereas the original theory focused on a very basic incompatibility between cognitions, these newer theories invoked higher-order, more complex processes. They changed the focus from inconsistency to the individual's self-concept and the individual's concern with harming others.

2.2.1. Self-consistency

In self-consistency theory, Aronson (1969, 1999) proposed that dissonance only occurs when a person acts in a way that violates his or her self-concept, that is, when a person performs a behavior inconsistent with his or her view of the self. Because most persons view themselves in a positive light, such that they are competent, rational, and moral, dissonance is experienced when a person behaves in an incompetent, irrational, or immoral way. One of the primary predictions derived from this revision is that high self-esteem individuals should respond with more dissonance reduction than low self-esteem individuals, because dissonance experiments induce individuals to act in ways discrepant from a positive self-view. Studies testing this prediction have produced mixed results: some showed that high self-esteem individuals showed greater attitude change, some showed that low self-esteem individuals showed greater attitude change, and some found no differences between self-esteem groups (see Stone, 2003, for review). Also, Beauvois and Joule (1996, 1999) obtained results that appear incompatible with this self-consistency revision. Therefore, the experience of dissonance and the engagement in dissonance-reducing activities does not appear to be limited to discrepancies involving the self-concept.

2.2.2. Self-affirmation

In his alternative to Festinger's dissonance theory, Steele (1988) proposed that individuals possess a motive to maintain an overall self-image of moral and adaptive adequacy. He stated that dissonance-induced attitude change

occurs because dissonance threatens this positive self-image. Whereas Festinger's dissonance theory posited that individuals are motivated to reconcile inconsistent cognitions, Steele proposed that, instead, individuals are merely motivated to affirm the integrity of the self or maintain a "perception of global integrity, that is, of overall moral and adaptive adequacy" (Steele et al., 1993, p. 885; see Sherman & Cohen, 2006, for a recent review). In support of this idea, Steele presented experiments where, following a dissonance induction, participants either were or were not presented with an opportunity to affirm an important value. When participants were allowed to affirm an important value, dissonance-related attitude change did not occur.

However, Simon et al. (1995) presented evidence supporting an alternative explanation for Steele's findings that was in line with the original theory of dissonance. Festinger's original theory proposed that the degree of dissonance experienced depended upon the importance of the dissonant and consonant cognitions. Simon et al. proposed that the mechanism by which self-affirmation reduced dissonance was by reducing the importance of the cognitions involved in the dissonance. They hypothesized that making an important value salient could reduce dissonance by reducing the individual's perception of the importance of the dissonant act, even if the value was unrelated to the self-concept. They conducted an experiment in which, following the induction of dissonance, participants were either given an opportunity to affirm an important value (i.e., "a self-affirmation condition, rank issues such as politics in term of their personal importance"), asked to consider a value that was not important to them personally but was of general importance (i.e., "an issue-salient condition, rank the same issues as above but in terms of their importance in general"), or were given no special instructions (control condition). Participants in the control condition changed their attitudes to be more consistent with the induced compliance behavior, as expected. Participants in both the self-affirmation and issue salient conditions did not change their attitudes. Writing about an important value caused participants to reduce the importance of the behavior and attitude to the point that attitude change did not occur. This occurred even when the values were not personally important and thus not self-affirming. Other evidence has been presented that is difficult to interpret in self-affirmation theory terms, such as evidence suggesting that self-affirmations relevant to the recent dissonant act increase rather than decrease dissonance-related attitude change (Aronson et al., 1999).

The self models of dissonance also have difficulty explaining the dissonance effects produced in rats (Lawrence & Festinger, 1962), as rats are believed to lack self conceptions of morality, rationality, and competence. Recent research has revealed that four-year-old humans and capuchin monkeys, who also lack the complex self-concepts which would seem to be required by self models of dissonance, show evidence of dissonance reduction (Egan et al., 2007). Hence, although self aspects appear to

moderate dissonance processes, they are not necessary to cause dissonance (Harmon-Jones, 2000d; Stone & Cooper, 2003). In terms of the original theory, self-related cognitions would be expected to affect the magnitude of dissonance, as cognitions related to the self are often important to an adult human. In other words, the experimental results derived from the self models are compatible with the original theory. Furthermore, the self models are unable to explain basic dissonance motivation effects concerning discrepancies that do not involve the self.

2.2.3. Aversive consequences

Cooper and Fazio (1984) proposed that the discomfort experienced in dissonance experiments was not due to an inconsistency between the individual's cognitions, but rather to feeling personally responsible for producing an aversive consequence. In support of this idea, Cooper and Worchel (1970) replicated and extended Festinger and Carlsmith's (1959) classic experiment in which participants were given low or high justification to claim that a boring task was interesting. In addition to the conditions of the original experiment, Cooper and Worchel added a condition in which, when the participant told the confederate that the boring task was interesting, the confederate was not convinced. Attitude change occurred only in the low-justification condition where the confederate believed the participant. This result and others (for review, see Cooper & Fazio, 1984) have been interpreted as indicating that dissonance-related attitude change only occurs when individuals feel personally responsible for producing an aversive consequence.

According to the original theory of cognitive dissonance, the production of aversive consequences would be expected to increase the amount of dissonance produced because an aversive consequence in itself may be an important dissonant cognition, or it may further strengthen one's behavioral commitment (see Harmon-Jones, 1999). However, the original theory would deny that an aversive consequence is *necessary* to produce dissonance. In the induced-compliance experiments testing the necessity of aversive consequences, there are a number of reasons why attitude change may have occurred *only* when participants' behavior led to aversive consequences. The null finding that attitudes were unchanged in the no-aversive-consequences conditions, like all null effects, is difficult to explain and subject to multiple alternative explanations. One possibility is that attitude change was produced, but the small sample sizes in these experiments may have had insufficient power to detect the change. Another possibility is that not enough dissonance was aroused in these experiments to produce attitude change without the additional important cognition of an aversive consequence. Finally, the dissonance in the no-aversive consequences conditions may have been reduced by some other route besides attitude change.

To examine whether attitude change could occur in an induced compliance setting in which aversive consequences were not produced, we

conducted several experiments (Harmon-Jones, 2000c; Harmon-Jones et al., 1996). Under the guise of an experiment on memory, participants were exposed to an attitudinal object (e.g., a boring passage they read). Participants were assured of privacy and anonymity, and then given high or low choice to write a counter-attitudinal statement (to manipulate justification) about the object. They were asked to discard the statement in the trash after writing it, so that there was no chance of the statement causing an aversive consequence. This manipulation was based on Cooper and Fazio's (1984) statement that, "making a statement contrary to one's attitude while in solitude does not have the potential for bringing about an aversive event" (p. 232). In other words, the experiments were designed so that aversive consequences were clearly absent to demonstrate that cognitive dissonance processes could occur in such situations.

In one experiment (Harmon-Jones et al., 1996), participants were asked to read a boring passage. They were then given high or low choice to write that they found the boring passage interesting. Although no aversive consequences were produced, persons in the high-choice condition changed their attitudes to be more favorable toward the passage. In addition, participants in high-choice condition evidenced more sympathetic nervous system arousal, as measured by nonspecific skin conductance responses, than those in the low-choice condition.

In another experiment, chocolate-loving participants wrote a statement that they disliked a piece of chocolate they had just eaten under conditions of low or high choice (Harmon-Jones, 2000c). Participants in the high-choice condition changed their attitudes to report a decrease in their enjoyment of chocolate. In addition, self-reported negative affect was increased following dissonance-producing behavior and was reduced following the attitude change. These experiments also demonstrate that the experience of cognitive dissonance evokes an unpleasant state that motivates discrepancy reduction.

The results obtained in these experiments indicate that dissonance affect and dissonance-related attitude change can occur in situations in which a cognitive inconsistency is present but does not involve the possibility of aversive consequences. Because participants' counterattitudinal statements were produced in private and with anonymity and were discarded after they were written, the participants did not cause an aversive consequence. In these experiments, participants did not lose a reward, gain a punishment, tell a lie to another person, or inflict any other kind of injury on other persons. There was simply an abstract benefit of helping in research. The discrepancy between the participants' perception of a stimulus and the participants' knowledge of what they had been induced to state about that stimulus was sufficient to create dissonance.

These experiments supported the original conception of dissonance theory over this revision. McGregor et al. (1999) have also discussed and

demonstrated that attitudinal ambivalence research has provided evidence of dissonance-related negative affect in the absence of feeling personally responsible for producing negative consequences. More specifically, they found that the simultaneous accessibility of participants' conflicting attitudes (i.e., how quickly and equally quickly conflicting evaluations came to mind) predicted the ambivalence participants felt (Newby-Clark et al., 2002). Nevertheless, some important questions regarding the basic mechanism underlying dissonance effects remained: Why does dissonance evoke this negative motivational state? Why does this state motivate attitude change?

3. ACTION-BASED MODEL OF DISSONANCE: WHY DO DISSONANCE PROCESSES OCCUR?

Festinger (1957) posited no answer to the question of why dissonance processes occur other than to state that inconsistency is motivating. Brehm and Cohen (1962) and Beauvois and Joule (1996, 1999) pointed out that a behavioral commitment is an important component of the dissonance process. However, in these previous statements, these theorists did not indicate why cognitions with implications for action motivate persons to engage in discrepancy reductions. The action-based model of cognitive dissonance was proposed to answer this "Why?" question (Harmon-Jones, 1999).

The action-based model concurs with theorizing in other areas of psychology in proposing that perceptions and cognitions can serve as action tendencies (Berkowitz, 1984; Dijksterhuis & Bargh, 2001; Fiske, 1992; Gibson, 1979; James, 1890; McArthur & Baron, 1983; Smith & Semin, 2004). Indeed, this perspective on perception/cognition is quite consistent with the situated cognition approach of Smith and Semin (2004), which proposes, among other things, (1) that mental representations are action oriented; (2) that cognition is embodied in that it draws on our sensorimotor abilities, environments, brains, and bodies; and (3) that cognition and action are the result of dynamic processes of interactions between an agent and environment.

The action-based model further proposes that *dissonance between cognitions evokes a negative affective state because it has the potential to interfere with effective and unconflicted action*. In essence, discrepant cognitions create problems for the individual when those cognitions have conflicting action tendencies. Dissonance reduction, by bringing cognitions into line with behavioral commitments, serves the function of facilitating the execution of effective and unconflicted action (see also, Jones & Gerard, 1967).

The action-based model proposes both a proximal and a distal motivation for the existence of dissonance processes. The proximal motive for reducing dissonance is to reduce or eliminate the negative emotion of dissonance. The distal motivation is the need for effective and unconflicted action. Thus,

consistent with the socially situated cognition approach (Smith & Semin, 2004), the action-based model assumes that emotion, cognition, and action constitute adaptive regulatory processes that ultimately serve survival needs.

Past discussions of the theory of cognitive dissonance have referred to two different constructs as “cognitive dissonance.” One is the inconsistency between cognitions. The second is the unpleasant emotional/motivational state that occurs when a person holds two contradictory cognitions. In order to better understand the processes of dissonance, the action-based model distinguishes between the two. We refer to inconsistency between cognitions as “cognitive discrepancy,” whereas we call the unpleasant emotive state “dissonance.” The unpleasant emotive state of dissonance provides motivation to change one’s attitudes or engage in other discrepancy-reduction processes.

After an individual makes a difficult decision, psychological processing should assist with the execution of the decision. The tendency of participants in dissonance research to view the chosen alternative more favorably and the rejected alternative more negatively after a decision may help the individual to follow through, to effectively carry out the actions that follow from the decision.

As an example, consider an important, effortful behavioral decision, such as beginning an exercise program. In this situation, the “actions” implied by the decision are the exercise behaviors. The benefits of exercise, from better-fitting clothes to improved long-term health, constitute consonant cognitions. The drawbacks of exercise, including the time commitment and muscle soreness, constitute dissonant cognitions. Dissonance affect comes from the conflict aroused by the dissonant cognitions, and this unpleasant affect motivates the individual to decrease the discrepancy by bringing the cognitions in line with the behavioral commitment. The better an individual is able to reduce the number and importance of dissonant cognitions and increase the number and importance of consonant cognitions, the more likely it is that he or she will faithfully perform the actions required by the exercise program over the long-term and reap its benefits.

In contrast to models of cognitive dissonance that view dissonance processes as irrational and maladaptive (Aronson, 1969), the action-based model views dissonance processes as adaptive. Of course, adaptive, functional psychological processes that are useful and beneficial in most circumstances may not be beneficial in all circumstances. Occasionally, dissonance reduction may cause persons to maintain a prolonged commitment to a harmful chosen course of action, when it would be better to disengage. However, when we state that dissonance processes are adaptive, we mean that they benefit the organism in the majority of cases.

In addition, we must distinguish between dissonance motivation and dissonance reduction. The action-based model, like the original theory, proposes that cognitive discrepancy produces negative affect, and that the negative affect motivates the individual to change his or her attitudes.

However, it is possible for a person to continue to maintain conflicting attitudes (although negative affect may persist). Furthermore, there are some situations in which individuals do disengage from harmful chosen courses of action, even though they may experience high levels of negative affect in the process.



4. TESTS OF THE ACTION-BASED MODEL

4.1. Action-orientation and spreading of alternatives

According to the action-based model of dissonance, the post-decisional state is similar to an action-oriented state (Beckmann & Irle, 1985; Gollwitzer, 1990; Kuhl, 1984), where the individual is in a mode of “getting things done.” Once a decision is made, an organism should be motivationally tuned toward enacting the decision and behaving effectively with regard to it. An implemental or action-oriented mindset is one in which plans are made to effectively execute behaviors associated with the decision (Gollwitzer & Bayer, 1999). We suggest that this implemental or action-oriented state is similar to an approach motivational state. When a person is in an action-oriented state, implementation of decisions is enhanced (Gollwitzer & Sheeran, 2006). We suggest that these action-oriented states and implemental states are similar to Jones and Gerard’s (1967) concept of an unequivocal behavior orientation.

We proposed that the action-oriented state that follows decision-making is equivalent to the state in which dissonance motivation operates and discrepancy reduction occurs (Harmon-Jones & Harmon-Jones, 2002). Thus, experimentally manipulating the degree of action-orientation experienced following a decision should affect the degree of discrepancy reduction. In one experiment, participants were asked to make either an easy decision or a difficult decision. Participants then completed a mindset questionnaire. The neutral mindset asked participants to list seven things they did in a typical day, whereas the action-oriented mindset questionnaire asked participants to list seven things they could do to perform well on the physical exercise they had chosen. Participants then reevaluated the exercises. Participants who made a difficult-decision in the action-oriented condition demonstrated a greater increase in preference for the chosen over the rejected exercise (i.e., spreading of alternatives) than participants in the other three conditions.

In a second experiment, we replicated the results of the first experiment using a different manipulation of action-orientation (Harmon-Jones & Harmon-Jones, 2002). In this experiment, action-orientation was induced by asking participants to think about a project or goal that they intended to accomplish, and to list the steps they intended to use to successfully follow

through with their decision (Gollwitzer, 1990). Two comparison conditions were also included, one in which participants wrote about a neutral, ordinary day and one in which participants wrote about an unresolved problem, which was defined as a problem characterized by the fact that they were not yet sure whether to take action to change things. Thus, as in the previous experiment, participants first made a difficult decision, but this time the decision was between two equally attractive research studies in which they could participate. Following the decision, participants completed the action-orientation manipulation described above, and then reread their attitudes toward the research studies. Results indicated that the participants in the action-orientation condition engaged in more spreading of alternatives following a difficult decision than did participants in the comparison conditions. This study provided stronger support for the action-based model because, in this case, the action-orientation induction was unrelated to the decision in the experiment.

Correlational evidence also suggests that action-oriented processing facilitates discrepancy reduction (Beckmann & Kuhl, 1984). In this study, dispositional action orientation was measured by Kuhl's (1980, 1984) action versus state orientation questionnaire. A sample item from the scale says, "When I have decided to buy one item of clothing and I find several things I like: (1) 'I often waver back and forth, trying to decide which I should buy' (state-oriented answer); and (2) 'I usually don't think much about it and make a quick decision' (action-oriented answer). Participants were individuals searching for an apartment and they were shown information about 16 apartments. Participants rated the attractiveness of the apartments before and after choosing the apartment they preferred (i.e., before and after a tentative decision). After the decision, individuals who were dispositionally high in action-orientation increased the attractiveness rating of the chosen apartment more than individuals who were dispositionally low in action-orientation. Thus, both state and trait evidence support our contention that dissonance reduction occurs in an action-oriented state—a state that assists in the implementation of decisions and in effective action.

4.2. Neural activity underlying dissonance and dissonance reduction

The action-based model of cognitive dissonance corresponds closely to recent models of self-regulation developed in the field of cognitive neuroscience, and it provides an important theoretical framework for placing neural processes in the context of motivated cognition. In this section, we describe findings from research on the neural processes associated with the monitoring of response conflicts and the implementation of intended behavior that are consistent with the action-based model of dissonance.

4.2.1. Dissonance arousal, conflict monitoring, and the anterior cingulate cortex

According to the action-based model, dissonance is aroused by the activation of cognitions that interfere with goal-driven behavior. Although few studies have directly examined the process of dissonance arousal in the brain, much attention has been given to questions of how the brain processes response conflicts on task such as the color-naming Stroop (1935) task. For example, when completing the color-naming Stroop task, one's goal is to identify the ink color of a word stimulus, regardless of the word's meaning. However, the processing of word meaning is typically automatic, and when a word's meaning is incongruent with one's goal to judge the word's color, such as when the word "red" is presented in blue ink, there is conflict between the intended and the automatic response tendencies. In studies examining neural activity during the Stroop task, anterior cingulate cortex activity is greater during incongruent trials than congruent trials (Carter et al., 1998). Similar findings have been observed using other response-conflict tasks, such as the Eriksen flanker's task (Gerhing et al., 1993; Eriksen & Eriksen, 1974), and the Go/No-Go task (Botvinick et al., 1999; Kiehl et al., 2001). Researchers have interpreted these findings as evidence that the anterior cingulate cortex plays an important role in monitoring the moment-to-moment representations of action tendencies for potential conflicts, presumably so that other neurocognitive mechanisms may be engaged to override the unwanted tendency and to promote an effective goal-directed response (Botvinick et al., 2001). Thus, conflict monitoring represents the first component of a dual-process model of cognitive control, whereby the need for control is initially detected.

Recently, we have suggested that the anterior cingulate cortex, and its associated role in conflict monitoring, corresponds well to the process of dissonance arousal (Harmon-Jones, 2004). The conflict-monitoring account is consistent with the action-based model of dissonance, because it too focuses on conflicts between action tendencies. Amodio et al. (2004) integrated the conflict-monitoring framework with social psychological theories of self-regulation by examining conflict between automatic stereotyping tendencies and participants' goals to respond without prejudice. In this study, anterior cingulate cortex activity was monitored using an event-related potential measure referred to as the "error-related negativity" component (Gerhing et al., 1993; van Veen & Carter, 2006). When participants—who reported low-prejudice attitudes—accidentally made responses that reflected the application of racial stereotypes, thus constituting a clear response conflict, the anterior cingulate cortex was strongly activated. By comparison, anterior cingulate cortex activity was lower on other trial types that did not elicit conflicting actions.

In subsequent research, Amodio et al. (2008) demonstrated that heightened anterior cingulate cortex activity associated with racially-biased responses was only observed for participants with strong personal

motivations to respond without prejudice. Participants without personal motivations (i.e., high-prejudice participants) did not show enhanced anterior cingulate cortex activity when their responses reflected the application of stereotypes. Thus, when participants made responses that were dissonant with their attitude-based intentions, anterior cingulate cortex activity was high. Furthermore, across studies, participants with stronger anterior cingulate cortex activity to dissonant responses were more likely to engage in controlled behavior (slower, more careful responding). These studies provided initial evidence for the role of the anterior cingulate cortex, and its associated conflict monitoring function, as a critical process underlying dissonance arousal. Importantly, this line of research demonstrated that high-level conflicts, the type with which dissonance theory has been most concerned, also activate the anterior cingulate cortex, in line with lower-level forms of conflict typically studied in the cognitive neuroscience literature (e.g., in studies using the Stroop task).

More recently, van Veen et al. (2007) examined dissonance-related brain activity more directly in a study that used the induced compliance paradigm. The authors observed heightened anterior cingulate cortex activity during the manipulation of dissonance, and participants' degree of anterior cingulate cortex activation was significantly associated with attitude change. The finding that dissonance reduction was associated with increased anterior cingulate cortex activation is consistent with the action-based model, which suggests that discrepancy reduction results from the need for effective and unconflicted action (distal motive). Although this interpretation of anterior cingulate cortex activity is compatible with the original theory of dissonance, it is not clearly compatible with other versions of dissonance, because these versions focus primarily on high-level self-consistencies (or other nonconsistency-oriented motivations such as aversive consequences or self-affirmation), and thus are not directly associated with coordinating action.

Response conflict tasks used in studies of the anterior cingulate cortex have also been found to cause increases in skin conductance, which indexes sympathetic nervous system arousal (Hajcak et al., 2003, 2004), and measures of negative affect such as the startle eyeblink response (Hajcak & Foti, 2008). Situations that typically evoke cognitive dissonance also cause increased skin conductance (Elkin & Leippe, 1986; Harmon-Jones et al., 1996; Losch & Cacioppo, 1990) and negative affect (Elliot & Devine, 1994; Harmon-Jones, 2000c; Zanna & Cooper, 1974). Taken together, these studies suggest that the anterior cingulate cortex is involved in generating the negative affective state of dissonance.

4.2.2. Dissonance reduction and the prefrontal cortex

The arousal of negative affect by cognitive discrepancy drives efforts to reduce the dissonant state, either through actions or cognitive restructuring (e.g., attitude change). The process of cognitive discrepancy reduction can

occur rapidly. Indeed, research has revealed that dissonance-related attitude change can occur immediately after individuals commit to engage in behavior and before they actually engage in the behavior (e.g., essay writing; Rabbie et al., 1959). According to the action-based model, the process of discrepancy-reduction engages approach-oriented motivational processes, as the individual works to successfully implement the new commitment. To our knowledge, only the action-based model makes the prediction that discrepancy reduction following commitment to action involves approach motivational processes, which the model views as part of the distal motive of effecting unconflicted behavior.

Recent neurocognitive models of control posit that the prefrontal cortex governs the implementation of a controlled response following the detection of conflict by the anterior cingulate cortex (Botvinick et al., 2001; Miller & Cohen, 2001). That is, as discrepancy-related activity in the anterior cingulate cortex rises, anterior cingulate cortex-to-prefrontal cortex communication or signaling increases. The prefrontal cortex is then believed to play a critical role in responding to the discrepancy by amplifying an intended response tendency to override the unintended tendency (Kerns et al., 2004). In relating the neurocognitive model of control to cognitive dissonance, the action-based model suggests that whereas the anterior cingulate cortex is associated with dissonance arousal, regions of the prefrontal cortex are critical for dissonance reduction. The dissociation between the neural processes related to dissonance arousal and discrepancy reduction supports the idea that these two processes reflect the operation of independent underlying mechanisms. However, the neurocognitive model of control does not clearly specify which regions of the prefrontal cortex contribute to different aspects of discrepancy reduction and action control, and it is silent on the role of motivation in the process of control.

Converging evidence from studies using a range of methods suggest that prefrontal cortex activity is lateralized on the basis of motivational direction, with the left frontal region being involved in approach motivational processes (“going toward”), and the right frontal region being involved in inhibitory or withdrawal motivational processes (“going away”). For instance, Robinson and colleagues (e.g., Robinson & Downhill, 1995) have observed that damage to the left frontal lobe causes depressive symptoms, with stronger depressive symptoms among patients with damage closer to the frontal pole. Given that depression relates to impaired approach-related processes (and associated approach-related emotion), damage to brain regions involved in approach motivation would lead to depression.

A growing body of research assessing electroencephalographic (EEG) activity has similarly found that increased left-frontal cortical activation relates to state and trait approach motivation (Amodio et al., 2007, 2008; Harmon-Jones, 2003, 2004; Harmon-Jones & Allen, 1997, 1998). Source localization of frontal asymmetry in alpha power, which comprises the

index of frontal asymmetry in EEG studies, has demonstrated that it reflects activity in the dorsal prefrontal cortex (Pizzagalli et al., 2005). Initial studies of the prefrontal cortex's role in motivation examined the association between greater left-sided frontal activity and questionnaire measures of behavioral approach sensitivity (Harmon-Jones & Allen, 1997) and the approach-related emotion of anger (Harmon-Jones & Allen, 1998). Subsequent research has related greater left-sided frontal activity to the state engagement in approach-related responses (Amodio et al., 2007; Harmon-Jones & Sigelman, 2001) and to the accessibility of approach-related goals (Amodio et al., 2004). In addition, several fMRI studies have observed greater left-sided prefrontal cortex activity during the retrieval of approach-related action words (Bunge, 2004; Petersen et al., 1988). These findings are consistent with the idea that the left prefrontal cortex is particularly involved in the implementation of intended action and the formation (and restructuring) of goals to guide future action. This body of findings is in line with the action-based model's position that the discrepancy reduction process serves to promote goal-directed behavior through the restructuring of goal-relevant attitudes and beliefs.

It is notable that the relation between right-sided prefrontal cortex activity and withdrawal motivation is less clear, with few EEG studies reporting an association between right-sided frontal activity and either state or trait assessments of withdrawal motivation. By comparison, several recent studies suggest that the right prefrontal cortex plays a special role in the inhibition of action (Aron et al., 2004). This evidence represents data from fMRI studies of normal participants as well as brain lesion patients. Given the remaining ambiguities concerning the frontal asymmetry and withdrawal motivation, more research is currently needed to clarify the relation between withdrawal motivation and response inhibition, both at the conceptual and neurocognitive levels of analysis (Amodio et al., 2008).

Considered as a whole, research on left prefrontal cortex function suggests that it is involved in approach motivational processes aimed at resolving inconsistency (MacDonald et al., 2000; van Veen & Carter, 2006). In what follows, we describe a set of studies that have examined the role of left prefrontal cortex activity and approach motivation as they relate directly to the resolution of dissonance-arousing discrepancies. The overarching prediction of the action-based model is that commitment to a chosen course of action should lead to an enhancement in relative left frontal cortical activity, which in turn should be associated with attitude change in support of the chosen course of action.

Induced Compliance and Relative Left Frontal Cortical Activation In an experiment by Harmon-Jones et al. (2008), participants were randomly assigned to a low versus high choice condition in an induced compliance paradigm. Immediately after starting to write the counterattitudinal essay

(regarding a tuition increase at their university), participants' EEG activity was recorded. After essay completion, attitudes were assessed. Participants in the high choice condition evidenced greater relative left frontal activation than individuals in the low choice condition (Harmon-Jones et al., 2008). Moreover, commitment to write the counter-attitudinal essay (high-choice) caused attitudes to be more consistent with the behavior, as compared to a low-commitment (low-choice) condition. However, in this experiment, relative left frontal activation did not relate to attitudes, perhaps because the attitude measure lacked the needed sensitivity (e.g., it did not tap attitude change from precommitment, but only tapped attitudes following the commitment).

Neurofeedback of Relative Left Frontal Cortical Activity and Free Choice In the previous experiment, when the psychological process (commitment to a chosen course of action) was manipulated and the proposed physiological substrate was measured (left frontal cortical activation), commitment to a chosen course of action increased relative left frontal cortical activation (Harmon-Jones et al., 2008). To provide stronger causal inferences regarding the role of the left frontal cortical region in following through with the commitment (discrepancy reduction), it is important to manipulate the physiology and measure the psychological outcome. Manipulation of the mediator also provides stronger causal evidence than simply correlating the proposed mediator with the outcome (Sigall & Mills, 1998; Spencer et al., 2005). Therefore, we conducted another experiment in which relative left frontal cortical activation was manipulated after dissonance was aroused to test whether a manipulated increase in relative left frontal cortical activation would increase dissonance reduction (attitude change).

To manipulate relative left frontal cortical activity, we used neurofeedback training of EEG. Neurofeedback presents the participant with real-time feedback on brainwave activity. If brainwave activity over a particular cortical region changes in the direction desired by the experiment, then the participant is given "reward" feedback; if brainwave activity does not change in the desired direction, either negative feedback or no feedback is given. Rewards can be as simple as the presentation of a tone that informs the participant that brain activity has changed in the desired way. Neurofeedback-induced changes result from operant conditioning, and these changes in EEG can occur without awareness of how the brain activity changes occurred (Kamiya, 1979; Siniatchkin et al., 2000). Participants typically are not aware of how they brought about changes in brain activity; in fact, extensive practice is required to gain awareness of how one may intentionally cause changes in brain activity (e.g., 8 weeks of practice, Kotchoubey et al., 2002).

In past research, neurofeedback was effective at decreasing but not increasing relative left frontal activity after only 3 days of training. The decrease in relative left frontal activity brought about with this brief neurofeedback training caused less approach-related emotional responses (Allen

et al., 2001). Based on these past results, we predicted that a decrease left frontal condition would be more successful at changing brain activity than an increase left frontal condition.

Most importantly, we predicted that a decrease in relative left frontal activity would lead to a decrease in discrepancy reduction as measured by spreading of alternatives. To test these predictions, we used the decision paradigm developed by Brehm (1956). First, participants were randomly assigned to increase or decrease relative left frontal activation during 2 days of neurofeedback training. Then, on the third day, immediately following a difficult decision, participants received neurofeedback training in the same direction as the previous 2 days. Finally, attitudinal spreading of alternatives was assessed. In support of predictions, neurofeedback training caused a reduction in relative left frontal cortical activity, which caused an elimination of the familiar spreading of alternatives effect (Harmon-Jones et al., 2008). Together with past research showing that commitment to a chosen course of action increases activity in the left frontal cortex (Harmon-Jones et al., 2008), this experiment's manipulation of relative left frontal cortical activity, a presumed mediator of the effect of commitment on discrepancy reduction, provides strong support for the role of relative left frontal activity in discrepancy reduction processes.

Action-Oriented Mindset and Relative Left Frontal Cortical Activation A follow-up experiment (Harmon-Jones et al., 2008, Experiment 2) was designed to conceptually replicate the experiment described in the previous section. In this experiment, we manipulated action-oriented mental processing following a difficult decision. We expected to replicate past research in which the action-oriented mindset increased discrepancy reduction following a decision (Harmon-Jones & Harmon-Jones, 2002). Secondly, we expected the action-oriented mindset would increase relative left frontal cortical activity. Finally, we expected this increase in left frontal cortical activity would relate to discrepancy reduction, as assessed by spreading of alternatives.

To further extend past research, we included a condition to manipulate positive affect that was low in approach motivation (i.e., participants wrote about a time when something happened that caused them to feel very good about themselves but was not the result of their own actions). This was done to distinguish between the effects of positive affect and of approach motivation on spreading of alternatives. Past research suggested that action-oriented mindsets increase positive affect (Taylor & Gollwitzer, 1995), but we do not predict that positive affect, itself, causes increased left frontal cortical activity or an increase in spreading of alternatives.

Results from the experiment were consistent with predictions and revealed that the action-oriented mindset increased relative left frontal cortical activity and spreading of alternatives, as compared to a neutral condition and a positive affect/low-approach motivation condition. See Figs. 3.1 and 3.2. These results

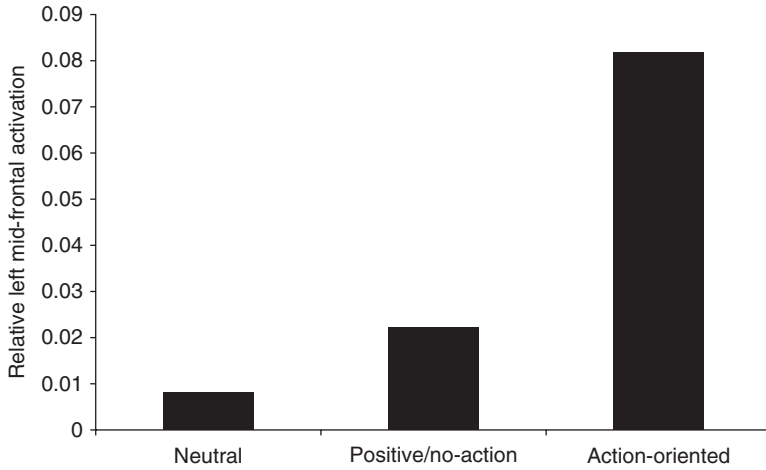


Figure 3.1 Relative left frontal activation as a function of mindset condition.

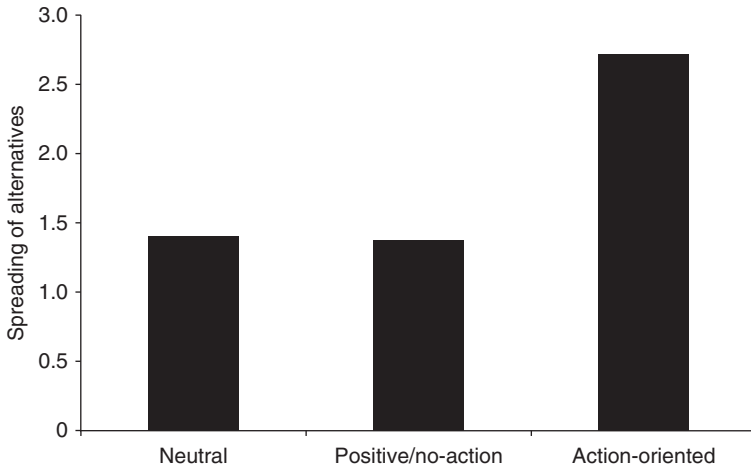


Figure 3.2 Spreading of alternatives as a function of mindset condition.

provide a conceptual replication of the past results by using a different operationalization of action-oriented motivational processing. Both experiments revealed that the hypothesized increase in action-oriented processing was manifested in increased relative left frontal cortical activity. Moreover, both

studies revealed that relative left frontal activation correlated positively with spreading of alternatives. This correlation occurred across both conditions within the neurofeedback experiment and within the action-oriented mindset condition of the second experiment. We suspect that the second experiment did not produce significant correlations within the neutral and positive-no-action conditions because, in these conditions, participants were instructed to think about information that was not associated with approach-motivated post-decision processing. In contrast, participants in the action-oriented mindset condition were instructed to think about information that should have facilitated approach-motivated post-decision processing, according to the action-based model and previous research.

Left prefrontal cortex activity and approach motivation following prejudice-related discrepancy Discrepancies between one's attitude and behavior are often investigated in the context of intergroup relations. For example, most White Americans today believe it is wrong to discriminate on the basis of race. But at the same time, most White Americans show evidence of automatically-activated tendencies to express racial stereotypes and negative evaluations. Thus, in intergroup situations, people are often confronted with a discrepancy between their nonprejudiced beliefs and their implicit tendencies to express prejudice. This phenomenon clearly represents a case of cognitive dissonance, although it is not typically described in such terms.

To examine the roles of left-prefrontal cortex activity and approach motivation in the context of prejudice, we preselected White American participants who reported holding low-prejudice attitudes in an earlier testing session (Amodio et al., 2007). Participants were told that we would examine their neural responses as they viewed pictures of White, Black, and Asian faces. Following this task, participants were given bogus feedback indicating that their neural activity revealed a strong negative emotional response toward Black faces, compared with White and Asian faces. This feedback was highly discrepant with participants' nonprejudiced beliefs and, as expected, aroused strong feelings of guilt on a self-report measure (beyond changes in other emotions), and participants were not immediately given an opportunity to engage in behavior that might reduce their guilt. Participants also showed a decreased in left-sided frontal cortical activity compared with baseline levels, and the degree of this decrease was correlated with their experience of guilt. This pattern suggested that the initial arousal of guilt-related dissonance was associated with a reduction in approach-motivation tendencies. Although this study was not designed to measure changes in anterior cingulate cortex activity, the decrease in left-sided prefrontal cortex activity is consistent with the idea that dissonance arousal is associated with a reduction in approach motivation accompanied by an increase in behavioral inhibition (e.g., Amodio et al., 2008).

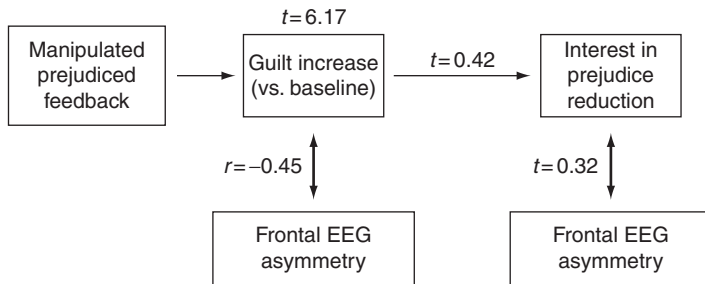


Figure 3.3 Summary of guilt study.

The effects of left-frontal activity and approach motivation were examined in the second part of the study. After the guilt manipulation, participants were told that the study was completed, but that in the time remaining in the session, they could help us by judging some stimuli ostensibly to be used in a future experiment. Here, we provided an opportunity to reduce their discrepancy-related guilt. We told participants that we wanted their feedback on different magazine articles that we might have participants in a future study read. Participants read the headlines of a series of different articles. Some headlines referred to articles associated with reducing prejudice (e.g., “Improving Your Interracial Interactions”). Others were filler headlines that were unrelated to intergroup relations (e.g. “Five Steps to a Healthier Lifestyle”). Participants viewed each title for 6 s while EEG was recorded. After viewing each title, they rated their personal desire to read the article. We found that participants who reported stronger guilty affect in response to the bogus feedback indicating their prejudiced response—an index of dissonance arousal—reported significantly stronger desire to read articles related to reducing prejudice. Induction-related feelings of guilt were unrelated to participants’ desire to read the filler articles. Furthermore, stronger desire to read prejudice reduction articles was associated with greater left-sided prefrontal cortex activity, consistent with the idea that discrepancy reduction involves the engagement of approach-related action (i.e., associated with egalitarian behavior), which involves activity of the left prefrontal cortex (Fig. 3.3). Hence, these results supported the action-based model of dissonance in the context of prejudice and feelings of guilt.

4.3. Increasing strength of action tendencies and discrepancy reduction

According to the action-based model of dissonance, dissonance should be increased as the salience of the action implications of cognitions that are involved in a dissonant relationship are increased. Several theoretical perspectives on emotion consider emotions to involve action tendencies

(Brehm, 1999; Frijda, 1986). To the extent that an emotion generates an action tendency, as the intensity of one's current emotion is increased and is involved in a dissonant relationship with other information, dissonance should be increased.

Research has demonstrated that the emotion of sympathy (empathy) increases helping behavior because it evokes altruistic motivation, that is, motivation to relieve the distress of the person in need of help (Batson, 1991). We conducted an experiment that tested whether an inconsistency between the emotion of sympathy and knowledge about past failures to act in accord with the sympathy would evoke motivation to reduce this inconsistency (Harmon-Jones et al., 2003).

In the experiment, we tested the hypothesis that after experiencing sympathy for a target person in need of help, individuals will be more motivated to help that person when they are reminded of times that they failed to help similar persons. This prediction is predicated on the idea that the aroused sympathy would be the "cognition" most resistant to change and that individuals would thus work to support it if dissonance were aroused in relation to it. Participants were informed that they would be listening to a pilot broadcast for a local radio station and that the researchers would like students' reactions to the tape. Participants then listened to a tape-recorded message that was purportedly from a person in need of help (an adolescent with cancer). Before listening to the tape, participants were assigned to one of two conditions: one in which they tried to imagine how the person must feel (high empathy set) or one in which they tried to remain objective as they listened to the tape (low empathy set). Then they listened to the tape-recorded message. Afterward, they completed questionnaires assessing self-reported emotional responses and evaluations of the tape-recorded message. Participants were then asked to list times when they failed to help other persons who were in need of help (in order to induce dissonance) or they completed a demographic survey (control condition). Finally, participants were given an opportunity to help by volunteering time to assist the person with addressing letters that would request money from possible donors or by donating money to the person's family. The design was a 2 (low vs high empathy) \times 2 (reminded of times that did not help vs not reminded) between-participants factorial. Consistent with predictions derived from the action-based model, more helping was observed in the high-empathy/reminder of past failures condition than in other conditions. See Fig. 3.4.

It is important to note that this experiment is similar to other dissonance research using a hypocrisy paradigm (Aronson, 1999; Stone et al., 1997). However, the present experiment differs from the hypocrisy research in an important way. In the hypocrisy experiments, the dissonance was aroused between a public behavior (e.g., video-taped speech to be delivered to other students about safe sex) and a reminder of past failures to practice what was

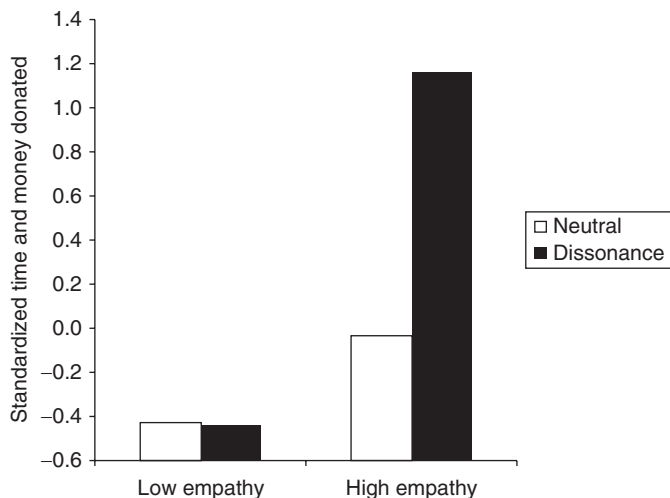


Figure 3.4 Amount of helping as a function of empathy and dissonance conditions.

spoken (i.e., they had not always practiced safe sex). In the current experiment, dissonance was aroused between a private emotional experience that generates an action tendency and a reminder of past failures to behave in accord with what the emotion motivates the person to do. Thus, past hypocrisy work only shares with the current experiment the explicit reminder of past failures to behave in certain ways. More importantly, the action-based model generated the hypothesis that because sympathy generates an action tendency, it can evoke dissonance. In general, we view past work on hypocrisy as consistent with the action-based model, because the conflicting “cognitions” have strong behavioral implications and the reduction of the dissonance between these “cognitions” enables one to behave effectively with regard to the cognition most resistant to change (i.e., in past studies, the information provided in the speech).

5. CONSIDERING THE ACTION-BASED MODEL AND OTHER MODES OF DISSONANCE REDUCTION

Would a change in action orientation and/or relative left frontal cortical activity affect discrepancy reduction in other dissonance-evoking situations? We would expect left frontal cortical activity to affect dissonance processes when dissonance is aroused by a strong commitment to behavior, which is what typically occurs in the induced compliance and free choice

paradigms (e.g., Beauvois & Joule, 1996; Brehm & Cohen, 1962). In such situations, we predict that individuals are motivated to follow through with their behavioral commitment and to change their attitudes to be consistent with their behavior (Stone et al., 1997). However, in some induced compliance situations, individuals may reduce dissonance by means other than attitude change, perhaps because their commitment is not sufficiently strong (Gilbert & Ebert, 2002) or because their original attitude is highly resistant to change (Simon et al., 1995). Thus, in other dissonance paradigms, we would predict relative left frontal activation to relate to dissonance reduction to the extent that dissonance is likely to be reduced via approach motivational processes, such as changing one's attitudes to be more supportive of the recent behavioral commitment.

Changing one's cognitions to bring them in alignment with each other is one way of reducing the negative emotion of dissonance. This is the method of reducing dissonance most often measured in research. However, this is not the only way a person can deal with the emotive state of dissonance. It is also possible to trivialize the dissonant cognitions (Simon et al., 1995) or engage in reality-escaping behaviors such as drinking alcohol to reduce the negative dissonance state and the motivation to engage in discrepancy reduction (Steele et al., 1981). The action-based model would predict that reducing dissonance by means other than attitude change would be more likely when action was not greatly needed or when the action implications of the cognitions were low.

It is also possible to experience dissonance and not reduce it. The negative emotion of dissonance provides motivation to change one's cognitions but this motivation may not always lead to such changes. In this situation, the cognitive discrepancy would still be present but the negative affect would remain elevated. The action-based model predicts that if an individual experiences dissonance but does not reduce it, the effectiveness of his or her behavior related to the commitment would be hampered. The effectiveness of behavior could be hampered by hindering pursuit and acquisition of an immediate goal or it may be hampered in more diffuse ways. These and other ways of dealing with cognitive discrepancies, and with the negative emotion of dissonance, need to be considered in future research.

The action-based model does not make the claim that dissonance reduction always occurs in the direction of a decision. Sometimes a person makes a decision and the evidence is overwhelming that the wrong decision has been made. This information would arouse dissonance. When a person realizes that he/she has made a mistake, his/her original decision is no longer the cognition most resistant to change. Consider Leon, who chose to attend one university over another. After beginning the first semester, Leon might realize that the university he chose is completely unsuitable for him. He will likely not be able to reduce the dissonance associated with his decision; rather, the negative emotion of dissonance would likely increase. At some point, as

dissonant cognitions continue to increase, he may choose to reverse his decision and look for a different university (Festinger, 1957, reports the results of such an experiment). Like the original theory of dissonance, the action-based model predicts that the direction of attitude change will be in the direction of the cognition that is most resistant to change.



6. INDIVIDUAL AND CULTURAL DIFFERENCES

Recent research has suggested that individual and cultural differences may moderate dissonance processes. For instance, individuals with greater preferences for consistency show greater attitude change after being given high-choice in an induced compliance situation (Cialdini et al., 1995), and individuals from Eastern cultures as compared to Western cultures show greater dissonance-related attitude change when inter-dependence is salient (Hoshino-Browne et al., 2005). As noted by Wicklund and Brehm (1976), individual (or cultural) differences in dissonance-related attitude change could emerge because of differences in the initial perception of discrepant cognitions, the awareness of dissonance, the tolerance of dissonance, and/or the mode of dissonance reduction. If attitude change is the only measure in a standard dissonance experiment examining individual differences, it is impossible to determine why a particular individual difference may be related to a pattern of attitude change. In order to determine why a particular individual, or cultural, difference relates to a pattern of attitude change, it would be necessary to measure the relationship of this difference to factors influencing dissonance.

Assuming no differences in the above variables (e.g., initial perception of discrepancy), the action-based model suggests that these individual and cultural differences may be associated with differences in the extent to which unconflicted action would be important. For example, preference for consistency may be related to tendencies toward action orientation. In addition, individuals high in preference for consistency may prefer consistency because of the implications inconsistency has for behavior, and they may be more concerned about executing effective behavior. With regard to cultural differences, cultures that value or emphasize the group over the individual may cause one to evaluate cognitions, their relevance to each other and to behavior, and their inconsistency according to group standards rather than individual standards. Alternatively, these cultures may differ in their tendencies toward individual versus group action orientation. In the following section, we review research conducted in the last two decades on the relationship between individual differences and dissonance processes. We then present data on a new questionnaire designed to measure aspects of the dissonance process.

6.1. Self-esteem

One individual difference that has received much empirical attention is self-esteem. This is because self versions of dissonance theory predicted that individuals who differed in self-esteem level would respond differently to dissonance-inducing situations. For example, the self-consistency revision proposed that persons with positive self-concepts should respond with more dissonance when they lie or act counter to their values (behaviors that have typically been used to evoke dissonance) because the discrepancy between their positive self-conception and their knowledge of their behavior (e.g., lying to another person) is greater for them than it is for persons with negative self-concepts who may have expected themselves to behave in these ways. In addition, the negative consequences of a decision (the negative aspects of the chosen and the positive aspects of the rejected), which suggest that the person made an unwise decision, are inconsistent with a positive self-concept. And individuals with high self-esteem should show greater evidence of discrepancy reduction following a difficult decision. Gibbons et al. (1997) provided evidence supporting this prediction. In their research, they found that smokers with high self-esteem who relapsed showed lowered perceptions of health risk associated with smoking and a greater decline in commitment to quitting smoking, whereas smokers with low self-esteem did not. Moreover, the decline in risk perception was related to maintenance of self-esteem for those who relapsed. These results support predictions derived from self-consistency theory, by showing that individuals with high self-esteem engaged in more discrepancy reduction than individuals with low self-esteem.

More recently, Jordan et al. (2003) found support for self-consistency theory's predictions using an approach that separates trait self-esteem into an explicit (more conscious) and implicit (less conscious) dimension. Based on the ideas (1) that explicit and implicit self-esteem are independent and (2) that individuals with high explicit but low implicit self-esteem may be particularly defensive, they predicted that such individuals would show greater discrepancy reduction than other individuals (i.e., low explicit/low implicit, low explicit/high implicit, and high explicit/high implicit). In this study, participants made a decision between two moderately positive and similarly rated food entrées. Then, following the decision, participants rerated the food entrées. Results revealed the predicted interaction of explicit and implicit self-esteem on spreading of alternatives. That is, individuals high in explicit but low in implicit self-esteem showed more spreading of alternatives than all other individuals. Thus, expansion of the understanding of self-esteem by incorporation of two independent dimensions—explicit and implicit—led to a new and refined prediction and result concerning the effect of self-esteem on discrepancy reduction.

In direct contrast to predictions derived from self-consistency theory, the self-affirmation model predicts that persons with high self-esteem would be less likely than persons with low self-esteem to engage in discrepancy reduction, because persons with high self-esteem have more positive self-concepts and self resources with which to affirm and repair their perception of self-integrity. According to the self-consistency model, the actions often elicited in dissonance experiments are more discrepant from a positive than from a negative self-concept, and thus individuals with high self-esteem should experience more dissonance when they engage in these actions. To test these competing predictions, Steele et al. (1993), using a free-choice paradigm, found that reminding individuals of their self-esteem levels by having them complete self-esteem scales prior to their decision caused individuals with low self-esteem to be more likely than individuals with high self-esteem to justify their decision (spread alternatives). Steele et al. (1993) concluded that these effects were opposite to effects predicted by the self-consistency model, but consistent with the self-affirmation model. It is important to note that justification of the decision (i.e., change in evaluation of the decision alternatives) did not differ between high and low self-esteem individuals in the condition in which they were not reminded of their level of self-esteem, suggesting that neither the self-consistency nor self-affirmation model can adequately explain the data.

In more recent work testing his self-standards model of dissonance, Stone (2003) has found that individuals with low self-esteem show less attitude change following induced compliance if their personal self-standards were primed (by rating their personal ideal for themselves on traits such as untrustworthy, precise, and ethical) immediately after the writing of the counterattitudinal essay. When normative standards (by rating what their peers thought they ought to be on traits such as untrustworthy, precise, and ethical) or no particular standards were primed, participants with low self-esteem showed the same amount of attitude change as participants with high self-esteem. Stone (2003) suggested that “for self-consistency to operate in dissonance, something in the context must make idiosyncratic self-knowledge accessible. Otherwise, dissonance processes are not necessarily moderated by individual differences in the structure and content of self-knowledge (p. 852).” Stone (2003) suggested that these results cast doubt on both self-affirmation and self-consistency theories, and he proposed that both the self-affirmation and self-consistency models are correct, but under different conditions.

6.2. Preference for consistency

Cialdini et al. (1995) developed a measure they referred to as preference for consistency. The questionnaire assessed self-reported agreement with 18 items such as “I prefer to be around people whose reactions I can anticipate”

and “I typically prefer to do things the same way.” In one study, individuals who scored in the lower and upper thirds of the distribution on preference for consistency participated in an induced compliance experiment. Results revealed that individuals high in preference for consistency engaged in more discrepancy reduction after high as compared to low choice. In contrast, individuals low in preference for consistency did not show a significant difference between high and low choice conditions. It is interesting to note, however, that the least favorable attitude occurred in the low choice/high preference for consistency conditions, and that the low and high preference for consistency groups’ attitudes did not appear to differ in the high choice condition.

Subsequent studies have revealed that individuals high, as compared to low, in preference for consistency experience greater negative affect when their highly inconsistent cognitions (i.e., evaluations of abortion) are made simultaneously accessible (Newby-Clark et al., 2002). In addition, higher preference for consistency is related to feeling more offended by being stood up by a friend for a poor reason (insufficient justification) as compared to a good reason (sufficient justification; Nail, Correll et al., 2001).

6.3. Action-orientation

Other evidence suggests that individual differences in action-orientation relates to discrepancy reduction (Beckmann & Kuhl, 1984). As reviewed previously, students searching for an apartment who were dispositionally high in action-orientation increased the attractiveness rating of their decision more than did individuals who were dispositionally low in action-orientation.

6.4. Cultural differences

Heine and Lehman (1997) found that North Americans and East Asians differ in their attitudinal responses to difficult decisions. Whereas North Americans showed the typical spreading of alternatives following the difficult decision (regarding choice over popular compact disc music selections), East Asians did not. This observed effect was not consistent with earlier observations by Sakai and colleagues (Sakai, 1981; Sakai & Andow, 1980) who had found dissonance-related attitude change following public but not private induced compliance.

However, Hoshino-Browne and colleagues (Hoshino-Browne et al., 2005) noted this discrepancy between results and suggested that the experiments by Sakai and colleagues may have produced dissonance-related attitude change because participants were concerned about the interpersonal consequences of their actions. That is, the participants, who were typically motivated to be interdependent with others and avoidant of interpersonal conflict, experienced dissonance because they had acted

inconsistently with those cultural ideals. To address these issues and others, Hoshino-Browne and colleagues conducted four studies in which European Canadians and Asian Canadians made difficult decisions for themselves or for a friend. Results indicated that whereas European Canadians spread alternatives more for self than friend decisions, Asian Canadians spread alternatives more for friend than self decisions. These results serve as a reminder that the importance of the cognitions was one of the factors affecting the magnitude of dissonance in Festinger's original theory. Cultural values would be expected to relate to the importance of cognitions, and thus, to the amount of dissonance these behaviors would evoke.

6.5. Concerns about individual differences research

Individual difference studies have shed new light on dissonance processes and connected the dissonance literature with other research literatures concerned with self processes and cultural differences. Moreover, the individual differences studies have increased the predictive power of the theory. Although some inconsistencies in results with individual differences and dissonance processes have been noted, subsequent studies have been conducted to address these inconsistencies.

Importantly, almost all studies of the relationship between individual differences and dissonance processes measured attitudes in the free choice or induced compliance paradigms. As noted by Wicklund and Brehm (1976), to fully understand the role of individual differences in dissonance processes, investigators need to be concerned with the variables (both independent and dependent) that are involved in dissonance. If only attitudes are measured in standard dissonance paradigms, it is difficult to know why a particular individual difference related to a particular pattern of attitude change results. Such designs leave open questions such as: Was dissonance aroused at all for the group of individuals who failed to show attitude change? Was dissonance aroused and not reduced at all or reduced via a mechanism other than attitude change? To assist in answering these questions, three variables need to be considered.

The first relevant variable is the initial perception of dissonant cognitions. A behavior that creates dissonance for one person may cause consonance for another. Consequently, when a group of individuals shows attitude change following a free choice but another does not, this result may be due to group differences in the initial perception of dissonant cognitions. Experiments designed with this variable in mind can explore the effects of such behaviors. Future research should explore ways of manipulating and measuring the initial perception of dissonance, as most dissonance studies simply expose individuals to one dissonance-evoking situation and then examine the effect of individual differences on attitudes.

The second set of variables involved in the dissonance process relates to dissonance arousal. Once the individual perceives a sufficient cognitive discrepancy, dissonance arousal should occur. Individuals are likely to differ in their awareness of this arousal, how long this awareness lasts, and the tolerance of this arousal. Differences may also exist in the causal relationship between dissonance arousal and discrepancy reduction. That is, some individuals may need more arousal to provoke discrepancy reduction.

The third set of variables involved in the dissonance process relates to dissonance or discrepancy reduction. Festinger (1957) predicted that dissonance reduction would first be aimed at cognitions that are least resistant to change. Experimental work by Gotz-Marchand et al. (1974) supported these predictions. Individual differences research has also supported these predictions. For example, following induced compliance, individuals high in public self-consciousness reduce dissonance via attitude change, presumably because they are more firmly committed to their public behavior than to their private attitudes (Scheier & Carver, 1980). In contrast, individuals high in private self-consciousness reduce dissonance via derogation of their behavior, presumably because they are more firmly committed to their private attitudes than their public behavior. Other, more recent work has suggested that the order of discrepancy-reduction mode presentation can have effects on discrepancy reduction, such that individuals seem most likely to use the mode presented first (Simon et al., 1995). It is possible that order effects such as these only emerge when the cognitions are roughly equal in resistance to change, because other research has suggested that, in general, individuals prefer to reduce dissonance via discrepancy reduction rather than through self-affirmation (Stone et al., 1997).

6.6. Creating a new individual differences measure related to dissonance processes

The specification of the three critical components of the dissonance process requires that studies concerned with individual differences measure or manipulate these variables to fully understand how a given individual difference relates to dissonance processes. Along the same lines, individual difference measures may be used to separate out the various aspects of the dissonance process. Because the first component of the dissonance process—the initial perception of the dissonance situation—is more amenable to manipulation than measurement, we sought to create a questionnaire that focused on assessing individual differences in the remaining two components: dissonance arousal and dissonance reduction.

Previous research on individual differences and their relationship to dissonance has typically focused on existing individual differences measures and their relationship to the dissonance reduction component (i.e., attitude change) in laboratory studies. However, one could instead start with the

experimental paradigms used by dissonance researchers and create an individual difference measure based on these paradigms. That is, we know that dissonance is evoked following difficult decisions, induced compliance, and the exertion of effort. By using these situations as a starting point for the creation of an individual differences measure, we could benefit from insights gained from decades of laboratory research on dissonance processes. Moreover, it would also permit an easy method of assessing individual differences in dissonance processes, thus allowing the extension of dissonance-based individual differences into other realms of inquiry. Finally, such a measure could permit the testing of theoretically-derived predictions in novel ways.

The action-based model specifies that dissonance arousal be separated conceptually and empirically from dissonance/discrepancy reduction. Accordingly, when we created the following individual differences measure, we generated some items that we thought would capture dissonance arousal/affect and other items that would tap dissonance/discrepancy reduction. In addition, we created items that measured reactions in three of the most commonly used dissonance paradigms—induced compliance, free choice/difficult decision, and effort justification.

We believed it important to separate dissonance arousal from discrepancy reduction, even though most past conceptualizations suggest a direct relationship between arousal and reduction. However, research has consistently failed to support this relationship, particularly when subjective reports of the negative affective experience of dissonance are measured (Elliot & Devine, 1994; Harmon-Jones, 2000c). That is, although some experiments found a positive correlation between discrepancy-produced negative affect and discrepancy reduction (attitude change) in the critical high-dissonance condition (Zanna & Cooper, 1974), other studies did not find such a correlation even though the dissonance situation created subjective negative affect (Elliot & Devine, 1994; Harmon-Jones, 2000c; Higgins et al., 1979). These results suggest that the subjective experience of negative affect need not correlate directly with discrepancy reduction measures such as attitude change. Indeed, individuals who continue to experience dissonance-related negative affect for prolonged periods may be the very individuals who have difficulty reducing the dissonance or engaging in discrepancy reduction. These individuals may be unable to alter their cognitions because their cognitions may be too resistant to change. In addition, individuals who experience high levels of dissonance-related negative affect may be more acutely aware of their negative affect and thus less able to reduce it through discrepancy reduction (Pyszczynski et al., 1993).

Thus, we predicted that dissonance arousal and dissonance reduction would be separate but correlated constructs. We also predicted that the arousal and reduction responses within the three dissonance situations would be inter-related.

After generating a set of appropriate items and having a large pool of undergraduate students respond to the items, we submitted the responses to an exploratory factor analysis. Then, on a separate sample, we conducted a confirmatory factor analysis. The resulting items of these two studies are shown in Table 3.1. The results of the confirmatory factor analysis revealed a model that contained six lower-order factors (dissonance situation X arousal/reduction) plus two higher-order factors (arousal vs reduction); see Tables 3.2 and 3.3. The results of this analysis are displayed in Fig. 3.5. We refer to the measure as the dissonance arousal and reduction questionnaire (DARQ; Harmon-Jones et al., 2008). Dissonance arousal and reduction are inversely correlated (see Fig. 3.5).

The DARQ subscales correlated with other measures with which they would be expected to correlate (see Table 3.4 for the list of questionnaires and their example items). For example, dissonance arousal correlated directly with Personal Fear of Invalidity, $r = 0.48$ (all reported correlations are significant, $p < 0.05$). Dissonance arousal also correlated directly with Response to Lack of Structure, $r = 0.34$. These questionnaires are subscales of the Personal Need for Structure and Personal Fear of Invalidity scales (Thompson et al., 1989; see also, Neuberg et al., 1997), which were designed to measure trait preferences for cognitive simplicity and structure. The third subscale from these scales, Desire for Structure, was not correlated with dissonance arousal, $r = 0.00$. Dissonance reduction, on the other hand, was directly correlated with Desire for Structure, $r = 0.13$, and inversely correlated with Fear of Invalidity, $r = -0.20$. It was not correlated with Responses to Lack of Structure, $r = -0.02$. In addition, Preference for Consistency (Cialdini et al., 1995) was not significantly correlated with dissonance arousal, $r = 0.08$, but was directly correlated with dissonance reduction, $r = 0.19$. These correlations help to establish the convergent validity of the DARQ, but because the correlations are far from perfect, they also suggest that the DARQ measures constructs different than these measures.

In addition, from the action-based model, we derived some predictions regarding the relationships of the DARQ with other variables. In particular, we predicted that dissonance reduction should relate positively to variables associated with effective behavior. To assess this, measures of depression, life satisfaction, and well being were included. Depression was measured with the Beck Depression Inventory (BDI; Beck et al., 1979), and life satisfaction was measured with the Satisfaction With Life Scale (Diener et al., 1985). Other dimensions of well being were measured with Ryff and colleagues' six dimensions of psychological well-being scale (Ryff & Keyes, 1995). These dimensions include positive evaluations of oneself and one's past life (Self-Acceptance), a sense of continued growth and development as a person (Personal Growth), the belief that one's life is purposeful and

Table 3.1 Factor analyses of dissonance arousal and reduction questionnaire (DARQ) items

DARQ Item	Subscale	Sample 1 (<i>N</i> = 428)	Sample 1 (Revised)	Sample 2 (<i>N</i> = 427)
1. After I work hard on something, I feel down and wonder whether it was worth it.	Effort – Ar.	0.63	0.61	0.67
2. After I work hard on something, I often wish I hadn't bothered.	Effort – Ar.	0.71	0.71	0.64
3. I really dislike the let-down feeling I have after I finish a big project.	Effort – Ar.	0.31	★★	★★
4. When I work hard on something, the results are usually disappointing.	Effort – Ar.	0.69	0.69	0.68
5. After I work hard on something, I really appreciate the results of my efforts.	Effort – Red.	0.74	0.74	0.71
6. My favorite things are the things I've had to work the hardest to get.	Effort – Red.	0.72	0.72	0.64
7. The harder I have to work to get something, the more I like it.	Effort – Red.	0.64	0.64	0.65
8. If something comes easily, it's not worth that much to me.	Effort – Red.	0.07	★★	★★
9. I really enjoy looking back on my work when the work was really hard.	Effort – Red.	0.67	0.67	0.61
10. If I have to work hard to achieve	Effort – Red.	0.75	0.74	0.68

Table 3.1 (continued)

DARQ Item	Subscale	Sample 1 (N = 428)	Sample 1 (Revised)	Sample 2 (N = 427)
something, I will afterwards find it more attractive.				
11. After I make a decision, I tend to stick with it.	Decision – Red.	0.63	0.62	0.57
12. Typically, I appreciate what I decided to do.	Decision – Red.	0.64	0.65	0.69
13. After making a decision, I'm happy with what I chose and I don't think about it anymore.	Decision – Red.	0.46	0.45	0.46
14. I feel good once I make up my mind about a tough decision.	Decision – Red.	0.68	0.69	0.58
15. I often regret my decisions.	Decision – Ar.	0.74	0.74	0.69
16. After making a tough decision, I often wish I could change my mind.	Decision – Ar.	0.63	0.62	0.69
17. I often suffer from regret after I buy something expensive.	Decision – Ar.	0.47	0.48	0.35
18. It's an awful feeling when I've made a difficult decision and there's no going back.	Decision – Ar.	0.38	0.39	0.52
19. I rarely regret things after making a tough decision.	Decision – Ar.	–0.36	★★	★★
20. I rarely feel guilty over mistakes I made.	Induced – Ar.	0.34	★★	★★

(continued)

Table 3.1 (continued)

DARQ Item	Subscale	Sample 1 (N = 428)	Sample 1 (Revised)	Sample 2 (N = 427)
21. I feel really bad about myself if I do something stupid.	Induced – Ar.	0.71	0.71	0.69
22. After I do something foolish, I dislike myself.	Induced – Ar.	0.62	0.62	0.71
23. Whenever I do something wrong, I feel like I'm not a good person.	Induced – Ar.	0.74	0.74	0.61
24. If I do something that makes me feel guilty, I usually can think my way out of the guilt.	Induced – Red.	0.26	★★	★★
25. If I do something that seems wrong at first, I soon realize that there was a good reason for it.	Induced – Red.	0.47	0.45	0.48
26. I can think of good reasons for things I've done, even things that might seem foolish to someone else.	Induced – Red.	0.68	0.70	0.72
27. When I think I've made a mistake, I often realize that I did the right thing after all.	Induced – Red.	0.50	0.50	0.30
28. There are always good explanations for things I have done, even things that might at first seem irrational.	Induced – Red.	0.57	0.56	0.60

Note. ★★omitted items. Ar. = arousal; Red. = reduction. All factor loadings estimated via maximum likelihood confirmatory factor analysis for six-factor oblique solution.

Table 3.2 Fit indices for six-factor (lower-order) models (corresponds to Table 3.1 loadings)

Model	χ^2	df	RMSEA	TLI (NNFI)	CFI	SRMR
Model 1 (Sample 1: exploration sample)	875.53	335	0.061	0.92	0.93	0.077
Model 1- Revised (Sample 1: exploration sample)	465.67	215	0.052	0.95	0.96	0.062
Model 2 (Sample 2: confirmation sample)	383.09	215	0.043	0.97	0.97	.052

Table 3.3 Fit indices for higher-order models (confirmation sample)

Model	χ^2	df	RMSEA	TLI (NNFI)	CFI	SRMR
Model A—one- factor model “unitary dissonance”	584.44	224	0.061	0.94	0.94	0.079
Model B—two- factor model “arousal and reduction”	506.13	223	0.055	0.95	0.96	0.072
Model C— three-factor model “effort, decision, and induced compliance”	581.04	221	0.062	0.94	0.94	.078

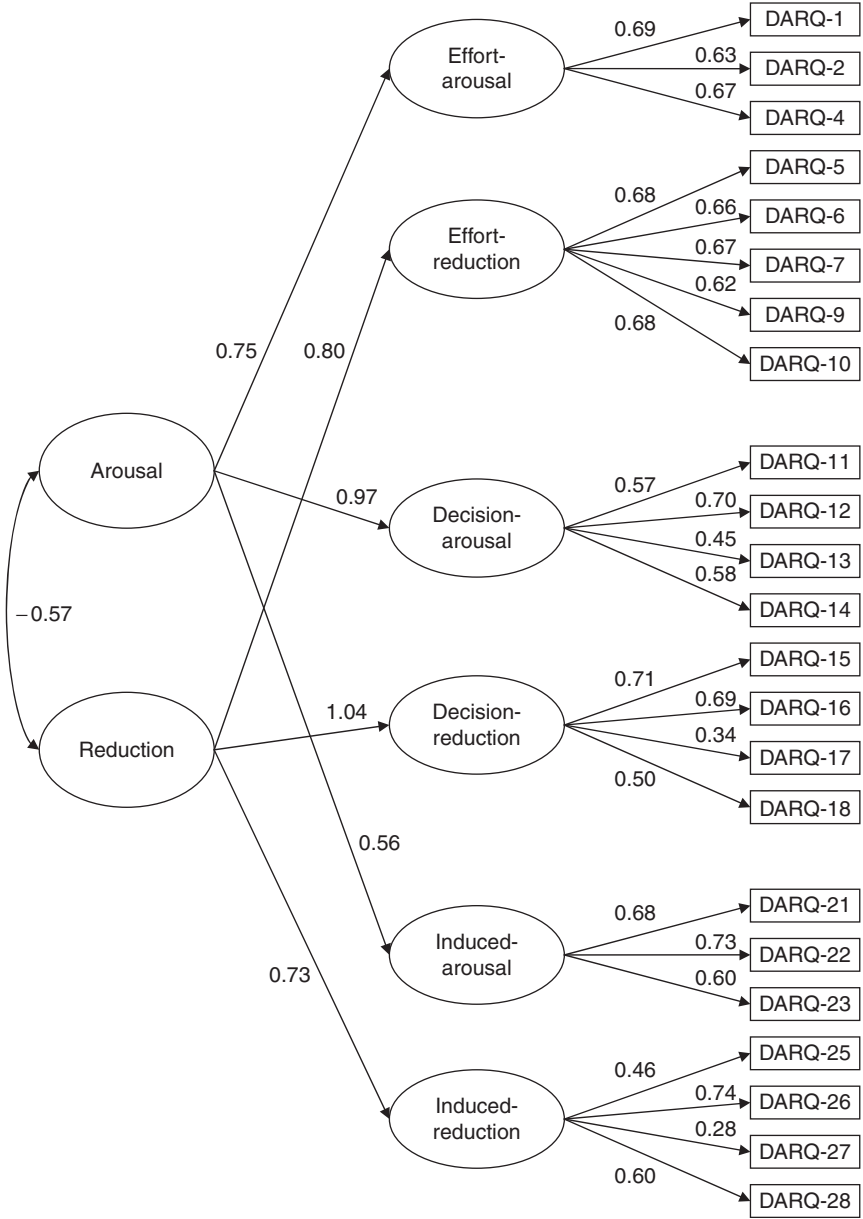


Figure 3.5 Hierarchical two-factor model of dissonance arousal and reduction.

Table 3.4 Example items for the personality scales**Personal Fear of Invalidity (Thompson et al., 1989)**

- Sometimes I become impatient over my indecisiveness.
- Sometimes I see so many options to a situation that it is really confusing.

Response to Lack of Structure (Thompson et al., 1989)

- It upsets me to go into a situation without knowing what I can expect from it.
- I hate to be with people who are unpredictable.

Desire for Structure (Thompson et al., 1989)

- I enjoy having a clear and structured mode of life.
- I like to have a place for everything and everything in its place.

Preference for Consistency (Cialdini et al., 1995)

- I prefer to be around people whose reactions I can anticipate.
- It is important to me that my actions are consistent with my beliefs.

Beck Depression Inventory (Beck et al., 1979)

- I do not feel sad; I feel sad; I am sad all the time, and I can't snap out of it; I am so sad or unhappy that I can't stand it. (participants select the statement that best describes them).
- I don't feel particularly guilty; I feel guilty a good part of the time; I feel quite guilty most of the time; I feel guilty all of the time. (participants select the statement that best describes them).

Satisfaction With Life Scale (Diener et al., 1985)

- In most ways my life is close to my ideal.
- The conditions of my life are excellent.

Ryff's Psychological Well-Being Scale (Ryff & Keyes, 1995)**Self-Acceptance**

- The past had its ups and downs, but in general I wouldn't want to change it.
- When I compare myself with friends and acquaintances, it makes me feel good about who I am.

Personal Growth

- I think it is important to have new experiences that challenge how you think about the world.
- I have the sense that I have developed a lot as a person over time.

Purpose in Life

- I am an active person in carrying out the plans I set for myself.
- I enjoy making plans for the future and working to make them a reality.

Positive Relations With Others

- People would describe me as a giving person, willing to share my time with others.
- I know that I can trust my friends and they know that they can trust me.

Environmental Mastery

- I am quite good at managing the many responsibilities of my daily life.

(continued)

Table 3.4 (continued)

<p>– I generally do a good job of taking care of my personal finances and affairs.</p> <p><u>Autonomy</u></p> <p>– I am not afraid to voice my opinions even when they are in opposition to the opinions of most people.</p> <p>– My decisions are not usually influenced by what everyone else is doing.</p> <p>Carver and White's (1994) BIS/BAS Scale</p> <p><u>BAS—Drive</u></p> <p>– When I want something, I usually go all-out to get it.</p> <p>– I go out of my way to get things I want.</p> <p><u>BAS—Reward Responsiveness</u></p> <p>– When I get something I want, I feel excited and energized.</p> <p>– When I'm doing well at something, I love to keep at it.</p> <p><u>BAS—Fun-seeking</u></p> <p>– I will often do things for no other reason than that they might be fun.</p> <p>– I crave excitement and new sensations.</p> <p><u>BIS</u></p> <p>– I feel pretty worried or upset when I think or know somebody is angry at me.</p> <p>– I feel worried when I think I have done poorly at something.</p>

meaningful (Purpose in Life), the possession of quality relations with others (Positive Relations With Others), the capacity to manage effectively one's life and surrounding world (Environmental Mastery), and a sense of self-determination (Autonomy).

As expected, dissonance arousal was inversely related to psychological well-being, whereas dissonance reduction was directly related to psychological well-being. Specifically, dissonance arousal related directly with depression ($r's > 0.40$). In contrast, dissonance arousal was related inversely with subjective well-being and all of Ryff's dimensions ($r's > -0.35$). Dissonance reduction, on the other hand, related inversely with depression, but directly with subjective well-being and all of Ryff's dimensions ($r's > 0.27$). The above relationship of dissonance arousal and depression (and subjective well-being) remained significant when controlling for Desire for Structure, Response to Lack of Structure, Fear of Invalidity, and Preference for Consistency. Identical results occurred for the relationship of dissonance arousal and Ryff's well-being dimensions. In addition, the relationship of dissonance reduction and depression (and subjective well-being) remained significant when controlling for Desire for Structure, Response to Lack of Structure, Fear of Invalidity, and Preference for Consistency. Identical results occurred for the relationship of dissonance reduction and Ryff's well-being dimensions.

Given the action-based model's predictions regarding the relationship between dissonance reduction and approach motivation, we predicted that dissonance reduction would relate to trait differences in approach motivation, as measured by Carver and White's (1994) Behavioral Activation Scale (BAS). As expected, dissonance reduction was directly related to BAS, $r = 0.41$. Dissonance arousal, on the other hand, was inversely related to BAS, $r = -0.15$.

This recent research using the DARQ suggests that dissonance arousal and dissonance reduction are separable but related constructs at the individual differences level of analysis. They both relate in expected ways with existing constructs but their overlap with these existing constructs is not so high as to suggest redundancy. Consistent with the action-based model, dissonance reduction was directly related to distal measures of effective behavior such as satisfaction with life, positive relationships with others, and environmental mastery. Moreover, dissonance reduction was directly associated with approach motivation, also in line with predictions derived from the action-based model. Taken together, these results suggest that use of the DARQ in future research may shed new light on cognitive dissonance processes.



7. CONCLUSION

The action-based model assumes that dissonance processes operate because they are functional, that is, most often useful for the organism. However, the action-based model does not claim that dissonance reduction is always functional. We think of dissonance processes as being similar to other functional, motivated behaviors such as eating. Eating is necessary for the survival of the organism; however, disordered eating can be harmful. Similarly, dissonance reduction often benefits persons by assisting them in acting on their decisions without being hampered by excess regret or conflict. However, if a person makes a poor decision and then reduces the dissonance associated with the decision, he/she will persist in acting on the decision when it might be advantageous to disengage. The action-based model proposes that dissonance reduction, while not always functional, is functional more often than not. In the majority of cases, it is advantageous for persons to reduce dissonance, and act effectively on their decisions. The dissonance-reduction mechanism functions to override continued psychological conflict that would potentially interfere with effective action.

We suggest that the action-based model provides an explanation of the underlying, basic motivation behind dissonance processes. The action-based model assumes that, in most cases, dissonance processes are behaviorally adaptive. Dissonance reduction primarily functions to facilitate effective

action. The reason organisms experience discomfort when they hold conflicting cognitions is because conflicting cognitions impede effective action. We hope that this new way of thinking about dissonance processes will stimulate research on dissonance theory and assist in connecting the large body of dissonance theory evidence with other research literatures concerned with action orientation, behavioral regulation, emotion regulation, and the neural processes that underlie these important psychological processes.

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AFFECT AS A PSYCHOLOGICAL PRIMITIVE

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Abstract

In this article, we discuss the hypothesis that affect is a fundamental, psychologically irreducible property of the human mind. We begin by presenting historical perspectives on the nature of affect. Next, we proceed with a more contemporary discussion of core affect as a basic property of the mind that is realized within a broadly distributed neuronal workspace. We then present the affective circumplex, a mathematical formalization for representing core affective states, and show that this model can be used to represent individual differences in core affective feelings that are linked to meaningful variation in emotional experience. Finally, we conclude by suggesting that core affect has psychological consequences that reach beyond the boundaries of emotion, to influence learning and consciousness.

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“... stimuli do something more than arouse sensation; they give rise to processes of a different kind, to “feelings” in a special sense; we do not merely take the impressions as they come, but we are affected by them, we feel them”

Titchener (1909, p. 226)

In English, the word “affect” means “to produce a change.” To be affected by something is to be influenced by it. In science, and particularly in psychology, “affect” refers to a special kind of influence—something’s ability to influence your mind in a way that is linked to your body. Historically, “affect” referred to a simple feeling—to be affected is to feel something. In modern psychological usage, “affect” refers to the mental counterpart of internal bodily representations associated with emotions, actions that involve some degree of motivation, intensity, and force, or even personality dispositions. In the science of emotion, “affect” is a general term that has come to mean anything emotional. A cautious term, it allows reference to something’s effect or someone’s internal state without specifying exactly what kind of an effect or state it is. It allows researchers to talk about emotion in a theory-neutral way.

In this review, we begin with a historical account of the concept of affect in psychology. This sets the stage for discussing the contemporary view of core affect as a basic, universal, and psychologically irreducible property of the mind. We then describe the brain areas that are responsible for realizing core affect, illustrating its central role in mental life. Next, we present the affective circumplex as a mathematical formalization for representing core affective states. We then describe evidence from our own laboratory demonstrating that the circumplex can model and represent individual variation in core affective feelings that are linked to differences in the precision of emotional experience (termed *emotional granularity*). Finally, we end by describing our most recent research on how affective variation has important psychological consequences that reach beyond the boundaries of emotion. We describe how core affect forms a basis for learning and grounds consciousness for other senses like seeing.



1. AFFECT IN THE HISTORY OF PSYCHOLOGY

Wilhem Wundt (1998b/1897), along with William James (1890), crafted the first psychological constructionist approaches to psychology (Gendron & Barrett, in press). Constructivist approaches are united in the assumption that the mental phenomena people experience and name (e.g., “thoughts,” “emotions,” “memories,” and “beliefs”) are events that result from the interplay of more basic psychological ingredients that are not

themselves specific to any single psychological phenomenon. Whereas James focused on the importance of raw sensory processing of somatic, visceral, vascular, and motor cues from the body as the basic building block of the mind, Wundt focused on the mental counterpart of those internal cues, which he called “affect.”¹

Affect, according to Wundt, is a feeling state that is a fundamental ingredient of the human mind. People are, wrote Wundt, likely “never in a state entirely free from feeling” (1897/1998b, p. 92). Wundt argued that affect is a direct (uninterpreted), psychologically primitive (psychologically irreducible) experience. He also argued that internally-generated sensations were as important to mental life as externally-driven sensations, so that affect (what he called “simple feelings”) and sensation were two sides of the same mental coin. Internal and external sensations “do not indicate separate objects,” wrote Wundt, “but different points of view from which we start in the consideration and scientific treatment of a unitary experience” (1897/1998b, p. 2). Wundt referred to simple feelings as the “affective tone of a sensation” (1897/1998b, p. 75).

Wundt described momentary affective states as having three independent qualities—pleasantness/unpleasantness (now called hedonic valence), arousing/subduing (arousal), and strain/relaxation (intensity). According to Wundt, these properties were not ingredients that make an affective response, because affect itself is irreducible and cannot be decomposed into more basic parts. Instead, valence, arousal, and intensity are descriptive features of a unified state. These three properties define the multidimensional affective space that people inhabit, such that a person’s momentary affective state can be described in these terms. Furthermore, Wundt believed that there was great variety in the nature of simple feelings, so that pleasure and displeasure did not refer to uniform states. It is “entirely untenable,” wrote Wundt, that the “unpleasurableness of a toothache, of an intellectual failure, and of a tragic experience are all regarded as identical in their affective contents” (p. 85).

Edward Titchener (Wundt’s student) largely agreed with Wundt, save two modifications (Titchener, 1909). First, Titchener believed that affect had only one property—hedonic valence—on the somewhat flawed reasoning that pleasure and displeasure were clearly accessible to introspection. Second, Titchener, more so than Wundt, believed that the content of feelings revealed their process (i.e., those feelings of pleasure and displeasure reveal the process of evaluation). This latter assumption has caused a great degree of confusion in scientific discussions about the basic dimensions of affect, as we discuss later.

Like most “dimensional” approaches, Wundt and Titchener did not argue that mental states are reduced to *only* affective feelings. Instead, they argued that

¹ In an earlier volume of *Physiological Psychology*, Wundt argued that affect is an attribute of sensation. In his 1896 *Outlines of Psychology*, he changed his view and argued that sensations and feelings are complementary elements (Titchener, 1908).

affect is a mental element that can become an emotion when combined with other mental elements. This assumption inspired many similar models of emotion during the first half of the twentieth century (e.g., Beebe-Center, 1932; Duffy, 1934; Gemelli, 1949a,b; Hunt, 1941; Ruckmick, 1936; Young, 1943) and defined a theoretical tradition that was carried forward by Schachter and Singer (1962), Mandler (1975), Russell (2003), and Barrett (2006b). Wundt, in particular, emphasized that emotions are not static things or entities, but instead are “psychical compounds” or composites that are constituted out of “psychical elements,” like affect, that are simple and irreducible in a psychological sense (1897/1998b, p. 101). He proposed that the additional element in emotion was “ideas,” which he described as “revival of previous experiences” (1894/1998, p. 452).² For our purposes, the important point is that most theorists who are labeled as having a “dimensional” perspective on emotion, including Wundt and Titchener, did not argue that affect was sufficient to explain mental states. They only proposed that it was necessary.

Wundt and Titchener inspired several decades of debate about affect during the first decades of the twentieth century. First, there was debate over whether affect was more like a sensation (i.e., a sixth sense to vision, taste, etc.) or like a mental feeling. Most writers favored the latter conclusion. For example, Alechsieff (1907; cited in Arnold, 1960) argued that affect is not a sensation on the grounds that it cannot be parsed and analyzed as distinct modalities like vision, audition, and touch. Koch (1913; cited in Arnold, 1960) added that affect is not a distinct sensory modality because it is derived from “diffuse organic sensations,” in effect arguing that affect can be distinguished from sensations that derive from the external sensory world, but not from those sensations that derive from the internal sensory world (i.e., the body). In modern terms, Koch’s proposal would be that affect is, essentially, a redescription of internal sensation in personally relevant terms. In contrast, Arnold herself argued that affect (as feeling) is completely separate from all sensations and always occurs in reaction to them. Importantly, Arnold’s writing forms the basis of most modern appraisal views of emotion.

² Wundt described how affective and ideational compounds combine via a specific temporal course in a way that strongly foreshadows the kind of stage model described by Schachter and Singer (1962) (and carried forward in some newer constructionist views, e.g., Russell, 2003). According to Wundt, emotions begin with an “inceptive feeling” that is affective in nature. The inceptive feeling is caused either by external sensory stimulation (what Wundt called “outer emotional stimulation”) or internal stimulation arising from associative or apperceptive conditions (what Wundt referred to as “psychical”) (1897/1998b, p. 171). Next, an “ideational process” distinguishes different emotional feelings from one another. Although Wundt did not provide a clear definition of what an ideational process is, his writing is at least suggestive that he is referring to some sort of embodied conceptualization close to that proposed by Barrett (2006b). Finally, there is a terminal feeling, which is basically a more diffuse affective state that remains after the more intense feelings have dissipated—similar to a mood state. Interestingly, Wundt argued that the psychical compounds combine to produce emergent emotional phenomena (in a way that is reminiscent of more recent treatments of emotion, e.g., Barrett, 2006b; Clore & Ortony, 2008). “The attributes of psychical compounds” Wundt wrote “are never limited to those of the elements that enter into them, but *new* attributes, peculiar to the compounds themselves, always arise as a result of the combination of these elements” (1897/1998b, p. 91).

A second debate inspired by Wundt and Titchener dealt with the question of whether affect is distinct from emotion. Most writers assumed that the answer was yes, but for different reasons. Some argued that feelings of pleasantness and unpleasantness are something more akin to an attitude or an action tendency derived from the feeling of wanting to approach or avoid an object (e.g., Carr, 1925; Hunt, 1939; Peters, 1935; Young, 1943). These feelings could then be shaped into emotion via additional processes. In these models, which have a largely constructionist flavor that is similar to Wundt and Titchener, emotion is just one class of affective feeling. Arnold (1960), on the other hand, used the word “affect” to refer to “feelings” as categorically separate from “emotions” which she described in more behaviorally mechanistic terms (i.e., a tendency to move towards or away from an object during basic emotions). For Arnold, affect is a state of mind that occurs in response to emotion—it is unpleasant to be angry or sad or afraid and pleasant to be excited or happy or tranquil. According to Arnold, both sensations and emotions inspire affective feeling (that are pleasant or unpleasant) by virtue of their influence.

Amidst these debates, the last century has seen a steady accumulating of evidence that Wundt’s initial proposals about affect were largely correct. In the next section, we discuss how a person’s momentary mental state (however it is categorized) can be described as pleasant or unpleasant with some degree of arousal. Together valence and arousal describe something psychologically primitive—a basic or “core” ingredient common to all psychological states. In the section following that, we describe the neuroanatomical evidence that a core affective state is, at once, tied to a person’s interoceptive sensations from the body and exteroceptive sensations from the world.



2. A MODERN WUNDTIAN VIEW: CORE AFFECT

Core affect is a state of pleasure or displeasure with some degree of arousal (Barrett, 2006b,c; Russell, 2003; Russell & Barrett, 1999). Together, valence and arousal form a unified state, so although it is possible to focus on one property or the other, people cannot feel pleasant or unpleasant in a way that is isolated from their degree of arousal.³ This kind of affect is referred to as “core” for a number of reasons.

Barring injury, core affect is grounded in the somatovisceral, kinesthetic, proprioceptive, and neurochemical fluctuations that take place within the core of body (Barrett, 2006a; Nauta, 1971). As we will see in the

³ This may be one reason why the Negative Affectivity/Positive Affectivity model of affect (Watson & Tellegen, 1985) and other similar models are so popular. The empirical basis for this model is grounded largely in self-reports of affective experience.

next section, core affect is realized by integrating incoming sensory information from the external world with homeostatic and interoceptive information from the body. The result is a mental state that can be used to safely navigate the world by predicting reward and threat, friend and foe.

Affect is a central feature in many psychological phenomena, including emotion (Barrett, 2006a,b; Diener, 1999; Russell, 2003), attitudes (e.g., Cacioppo & Berntson, 1994; Eagly & Chaiken, 1998; Ito & Cacioppo, 2001), stereotyping and prejudice (e.g., Cacioppo & Berntson, 2001; Forgas & Fiedler, 1996; Mackie & Hamilton, 1993; Moreno & Bodenhausen, 2001), verbal communication and negotiation strategies (e.g., Forgas, 1998, 1999a,b), judgment and decision-making (e.g., Forgas, 1995; Haidt, 2002; Slovic et al., 2002), predicting the future (e.g., Gilbert & Ebert, 2002; Gilbert et al., 1998), work motivation (e.g., Seo et al., 2004), psychopathology (e.g., Davidson, 2000; Davidson et al., 2002), well-being, (e.g., Davidson, 2004), health (Gallo et al., 2005), and personality (e.g., Revelle, 1995; Watson, 2000; Yik et al., 2002). Core affect provides a common metric (or what neuroeconomists call a “common currency”) for comparing qualitatively different events (Cabanac, 2002), and can serve as the basis for moral judgments of right and wrong (Greene et al., 2001; Haidt, 2001). It also serves as a basis of language comprehension. A speaker’s tone of voice (speaking rate, tone of voice, and intonation) as well as acoustical cues to the identity of a speaker routinely impacts the affective state of the listener (Nygaard & Lunders 2002; Owren & Rendell, 1997) and these cues influence lexical processing (Schirmer & Kotz, 2003; Wurm et al., 2001). Affective tone even influences the perception of spoken words, making it easier to recognize some words and harder to recognize others (Nygaard & Queen, 2008). In the final section of the paper, we discuss how core affect is important in normal object perception (see Barrett & Bar, *in press*). People see with feeling. We “gaze,” “behold,” “stare,” “gape,” and “glare.” Without affect, there is visual sensation, but no sight.

Core affect also represents a basic kind of psychological meaning. The basic acoustical properties of animal calls (and human voices) directly act on the nervous system of the perceiving animal to change its affective state and in so doing conveys the meaning of the sound (Owren & Rendall, 1997, 2001).⁴ All words (regardless of language) have an affective dimension of meaning (Osgood et al., 1957), so that people cannot communicate without also (often inadvertently) communicating something about their affective state. Learning a new language fluently does not merely require making a link between the phonological forms of words and their denotation, but a connection to affective changes must also be forged.

⁴ The acoustical properties that reflect the identity of the sender (reflected in “sonants” and “gruffs”) indirectly influence the affective state of the perceiving animal based on its prior experience with the sender, whether it is animal (Owren & Rendall, 1997) or a human speaker (Bliss-Moreau et al., manuscript under review).

Finally, as we discuss in the final section of the paper, affective changes are “core” because they are crucial to the conscious experience of the world around us (for a discussion, see Duncan & Barrett, 2007). Affective changes are often experienced as a property of an object, in much the same way as color (people say “The sky is blue” rather than “I experience the sky as blue” or “Light from the sky at 500 nm is striking my retina which I experience as blue”). Indeed, objects in the world are said to be “positive” or “negative” by virtue of their capacity to influence a person’s core affective state. For example, if the perception of a snake involves unpleasant, high arousal affect, then the snake is said to *be* negative and arousing.

People are often aware of their core affective state, although they need not be. The capacity to have core affective states is psychologically universal and biologically basic, although people largely learn which sensory patterns predict threat and reward through experience. Infants (Lewis, 2000) and people in all cultures around the world have core affective experiences (Mesquita, 2003). Scientists can clearly measure core affect in the face (for reviews, see Cacioppo et al., 2000), in the voice (for reviews, see Bachorowski, 1999; Russell et al., 2003), and in the peripheral nervous system (for reviews, see Bradley & Lang, 2000; Cacioppo et al., 2000). As a consequence, core affect can be thought of as a neurophysiologic barometer of the individual’s relationship to an environment at a given point in time, with self-reported feelings as the barometer readings.



3. THE NEURAL REFERENCE SPACE FOR CORE AFFECT

With several decades of modern neuroscience evidence to draw from, it is now possible to see that Wundt was probably right about the relation between affect and external sensations. Both neuroanatomical and neuroimaging evidence suggests that people don’t evaluate an object for its personal significance once they already know what it is. Their affective reaction to the external sensory array helps the brain to make external sensations meaningful, aiding perception in a very basic way.

The distributed circuitry for core affect can be found in every mammalian brain and is particularly elaborated in the human brain (Fig. 4.1). These areas represent crucial components of a network that bind sensory stimulation from inside the body to that coming from outside the body, and in so doing each gives the other informational value. Some parts of affective circuitry are strongly interconnected with sensory cortical areas, whereas others are strongly interconnected with areas that direct the autonomic and hormonal responses to regulate the homeostatic state of the body (Barrett & Bar, in press). The strongly re-entrant nature of neural activity makes it difficult to derive simple cause and effect relationships between the brain and the body, or between sensory and affective processing.

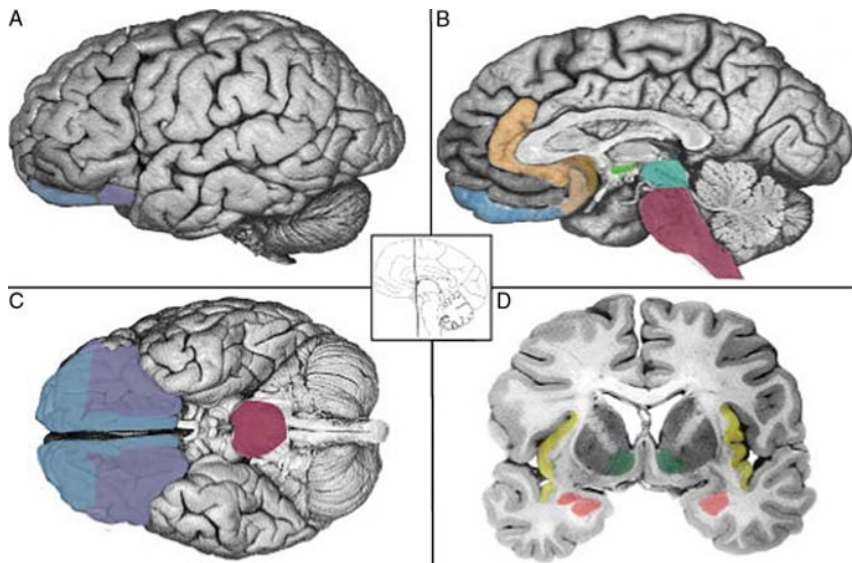


Figure 4.1 The hypothesized neural reference space for core affect. Brain areas that realize core affect include the visceromotor and sensory integration networks in the OFC (A–C, blue, and purple, respectively), the anterior insula (D, yellow), the amygdala (D, rose), subgenual and pregenual parts of the ACC (B, copper, tan), the hypothalamus (B, light green), and the ventral striatum (D, dark green). Also included are the midbrain (B, turquoise) and brainstem (B, C, dark pink). Adapted from Barrett et al. (2007). Refer online version of the chapter for color figure.

Core affective circuitry includes brain areas that are traditionally considered to be “emotional,” such as the amygdala and ventral striatum. The amygdala’s role in affective circuitry is not to code for fear, or threat, or anything negative per se. Instead, the amygdala’s function is to direct the various sources of attention (Holland & Gallagher, 1999) towards a source of sensory stimulation (such as an object) when the predictive value of that stimulation is unknown or uncertain (cf. Barrett et al., 2007). As a consequence, the brain can orchestrate physiology and physical actions that allow it to learn more about the object to better predict its value on future encounters. The amygdala’s work is complete once an object’s value is known for that particular context and in that particular instance. When the threat or rewarding value again becomes uncertain the amygdala is once again engaged (e.g., Barad et al., 2006; Herry et al., 2007). This interpretation is not only consistent with the neuroscience research showing that rats freeze during aversive classical conditioning (in our view mistakenly called “fear” conditioning), but it is also consistent with the research showing that the amygdala is selectively engaged by novelty (e.g., Dubois et al., 1999; Schwartz et al., 2003; Wilson & Rolls, 1990; Wright et al., 2003, 2006, 2007, 2008) and ambiguity (Hsu et al., 2005), and quickly habituates to stimuli as they become

familiar (Breiter et al., 1996; Wedig et al., 2005; Wright et al., 2001, 2003).⁵ Furthermore, amygdala lesions disrupt normal responses to novelty in primates (e.g. Prather et al., 2001). For a related view, see Whalen (1998).

The ventral striatum (and the larger mesolimbic dopamine system of which it is a part) does not code for reward or positivity per se, but instead gates attention to novel, salient, or unexpected environmental events that require an effortful (usually behavioral) response, regardless of whether they are positive or negative (e.g., Berridge & Robinson, 1998; Horvitz, 2000, 2002; Salamone et al., 2005, 2007; Schultz et al., 1993). Consistent with this view, both approach and withdrawal behaviors in rats are facilitated via electrical stimulation of the rostral and caudal shells of the nucleus accumbens (which is part of the ventral striatum; Reynolds & Berridge, 2001, 2002, 2003) and approach behaviors become dopamine independent with overtraining (Choi et al., 2005). Dopamine neurons within the ventral striatum increase their firing rates when surprising or unexpected appetitive events are presented (McCullough & Salamone, 1992), but firing rates do not increase when appetitive events are predictable (Mirenowicz & Schultz, 1994). New evidence in rats demonstrates a context dependent functional remapping of cells in the nucleus accumbens; the same cells code for reward or threat depending on the context in which the rat is placed (Reynolds & Berridge, 2008).

Core affective circuitry also includes paralimbic portions of prefrontal cortex that until recently have been considered “cognitive” (cf. Duncan & Barrett, 2007). These areas include the lateral portions of the orbitofrontal cortex (OFC) extending back to the agranular insula and laterally to the ventrolateral prefrontal cortex (vlPFC), as well as the medial portions of the OFC (sometimes included in the ventromedial prefrontal cortex or vmPFC) extending back to the subgenual and pregenual portions of the anterior cingulate cortex (ACC) on the medial wall. The OFC is a heteromodal association area that integrates sensory inputs from the external world and from the internal body to create a multimodal representation of the world at a particular moment in time (Mesulam, 2000). It plays a role in representing reward and threat (e.g., Kringelbach & Rolls, 2004) as well as in hedonic experience (Kringelbach, 2005; Wager et al., 2008).

Figure 4.1 demonstrates how the amygdala, ventral striatum, and OFC (including the vmPFC), along with the ACC, insula, thalamus, hypothalamus, and autonomic control centers in the midbrain brainstem, constitute a large-scale *neural reference space* that realizes neural representations of sensory information from the world as well as its somatovisceral impact (Barbas, 2007; Ghashghaei & Barbas, 2002; Ongur et al., 2003; reviewed in Duncan & Barrett, 2007). This description of affective circuitry is meant to be

⁵ In our view, freezing is not a behavioral index of fear. Freezing can be thought of as an alert, behavioral stance that allows a creature to marshal all its attentional resources to quickly learn more about stimulus whose threat value is uncertain (e.g., a tone that is suddenly paired with a footshock).

nonspecific without sounding vague, in that a “neural reference space” (according to neuroscientist Gerald Edelman) refers to a neuronal workspace that implements the brain states that correspond to mental states. Different brain states are implemented as flexible neuronal assemblies, so that a given neuron need not participate in every brain state within a class (such as reward or hedonic pleasure), or even in the exact same mental state at two different points in time. The assembly of neurons involved in realizing the constantly changing flow of affective states shifts from moment to moment, so that particular neurons are selective for affect but may not be specific to affect in any way.⁶ Furthermore, this circuitry, although not specific to emotion, is nicely illustrated within a meta-analysis summarizing functional magnetic resonance imaging (fMRI) and positron emission tomography (PET) studies of emotion and affect published between 1990 and 2005 (see Fig. 4.2; Wager et al., 2008).

Although the details are continually being researched, the available evidence suggests that this larger neutral reference space for core affect can be subdivided into two related functional networks (for reviews, see Barbas & Pandya, 1989; Carmichael & Price, 1996; Hurliman et al., 2005; Ongur & Price, 2000; Ongur et al., 2003). The first functional network is a *sensory integration network*. This network establishes an experience-dependent, value-based representation of an object that includes both external sensory features of an object along with its impact on the homeostatic state of the body. It includes the cortical aspects of the amygdala (specifically, the basolateral complex (BL)), the central and lateral portions of OFC, as well as most of the adjacent agranular insular areas. The sensory integration network has robust connections with unimodal association areas of many sensory modalities (Barbas, 1993, 2000; Carmichael & Price, 1995; Cavada et al., 2000; Ghashghaei & Barbas, 2002; McDonald, 1998), including the anterior insula that represents interoceptive sensations (Craig, 2002).

The second functional network is a *visceromotor network* and is part of a functional circuit that guides autonomic, endocrine, and behavioral responses to an object. It includes the medial portions of the OFC (extending into what

⁶ Our starting assumption is that core affective states are realized in a broadly distributed system within the mammalian brain. This view is inspired by constraint satisfaction logic that represents how the brain works (Barrett et al., 2007; O'Reilly & Munakata, 2000; Spivey, 2007; Wager & Thagard, 2004), as well as newer evidence on population-based coding and multi voxel pattern analysis where information is contained in spatial patterns of neuronal activity across the brain (Norman et al., 2006). In our view, different instances of core affect (combinations of hedonic valence and arousal) correspond to different brain states (flexible, distributed assemblies of neurons) from moment to moment, but these need not be localized in different parts of the brain. Two specific instance of high arousal, negative affect can be realized in different neuronal assemblies, even within the same person. A given neuron, because it receives input from many other neurons, can participate (in a probabilistic sense) in more than one neuronal assembly at the same time. It is even the case that single neurons can respond to different classes of information, depending on the frequency of firing (or the context) (Basole et al., 2003; Izhikevich et al., 2003; Reynolds & Berridge, 2008), so that even neurons are probably not specific to a single feature or content.

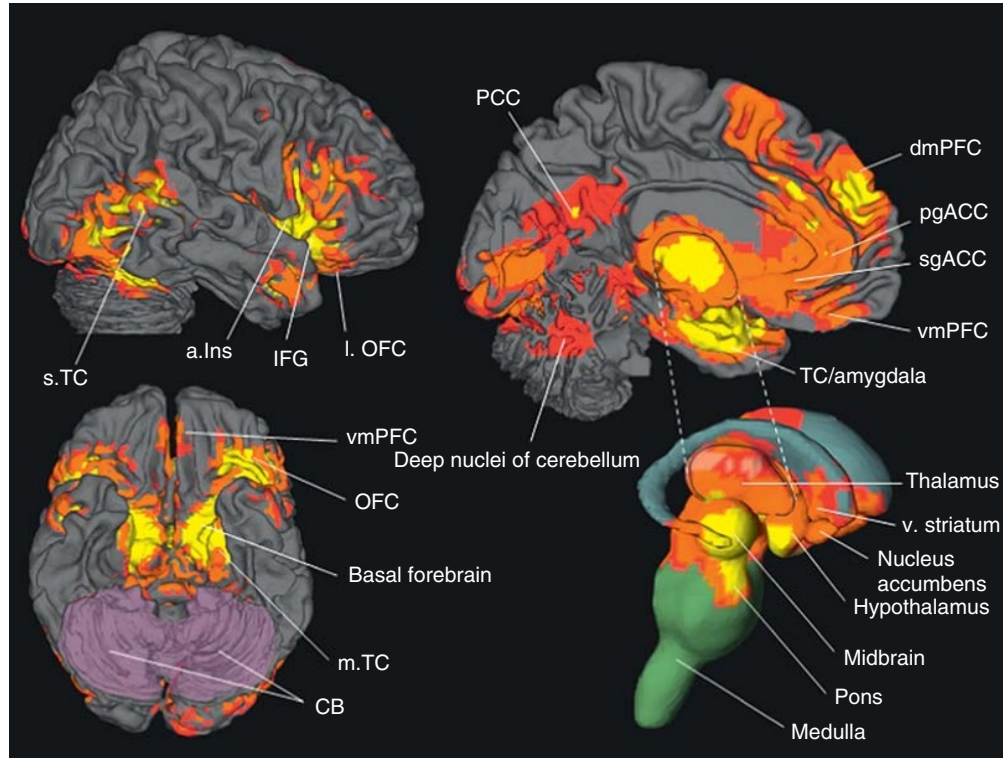


Figure 4.2 The observed neural reference space for core affect. 165 neuroimaging studies of emotion (58 using PET and 107 using fMRI) published from 1990 to 2005 were summarized in a multilevel meta-analysis to produce the observed neural reference space for emotion (Wager et al., 2008). These areas include (from top left, clockwise) anterior insula (aIns), lateral OFC (lOFC), pregenual cingulate cortex (pgACC), subgenual cingulate cortex (sgACC), ventral medial prefrontal cortex (vmPFC), temporal cortex/amygdala (TC/Amygdala), thalamus, ventral striatum (v Striatum), nucleus accumbens, hypothalamus, midbrain, pons, medulla, OFC, and basal forebrain. Other areas shown in this figure (e.g., inferior frontal gyrus (IFG), superior temporal cortex (sTC), dorsal medial prefrontal cortex (dmPFC), posterior cingulate cortex (PCC), medial temporal cortex (mTC), and cerebellum (CB)) relate to other psychological processes involved with emotion perception and experience. (See online version of the chapter for color figure).

is sometimes called the vmPFC), as well as subgenual and pregenual areas of the ACC, with robust reciprocal connections to all limbic areas (including many nuclei within the amygdala, and the ventral striatum), as well as to the hypothalamus, midbrain, brainstem, and spinal cord areas that are involved in internal-state regulation (Barbas & De Olmos, 1990; Barbas et al., 2003; Carmichael & Price, 1995, 1996; Ghashghaei & Barbas, 2002; Ongur et al., 1998; Price, 2007; Rempel-Clower & Barbas, 1998). These areas modulate changes in the viscera associated with the autonomic nervous system (including tissues and organs made of smooth muscle, such as the heart and lungs) and neuroendocrine changes that affect the same organs by way of the chemicals released into the bloodstream via hypothalamic regulation of the pituitary gland. In addition, the visceromotor network (particularly the vmPFC) is important for altering simple stimulus-reinforcer associations via extinction (Milad et al., 2005; Phelps et al., 2004; Quirk et al., 2000) or reversal learning (Fellows & Farah, 2003) and appears to be useful for decisions based on intuitions and feelings rather than on explicit rules (Dunn et al., 2006; Goel & Dolan, 2003; Shamay-Tsoory et al., 2005), including guesses and familiarity based discriminations (Bechara et al., 1997, 1999; Elliott et al., 1999, 2000; Schnider et al., 2000; Schnyer et al., 2005; Weller et al., 2007).

The circuitry within the neural reference space for core affect binds sensory information from the external world to sensory information from the body, so that every mental state is intrinsically infused with affective content. When core affect is in the background of consciousness, it is perceived as a property of the world, rather than as the person's reaction to it. It is under these circumstances that scientists usually refer to affect as "unconscious." We experience a world of facts rather than feelings, and affect gives us a sense of confidence in those facts. This is why a drink tastes delicious or is unappetizing (e.g., Berridge & Winkielman, 2003; Winkielman et al., 2005), why we experience some people as nice, and others as mean; and why some paintings are beautiful whereas others are ugly. When core affect is experienced as a property of the world it acts in stealth by directly translating into a behavior. We have another sip of Bordeaux because it tastes so good. We avoid an acquaintance on the street because he is mean. We stand for hours looking at the details of a painting because it is captivating. When affect is backgrounded in consciousness, we refer to "affective stimuli"—but affect is never a property of a stimulus—it is a feature of a person's response to that stimulus. An object is said to have affective value precisely because it has the capacity to influence an individual's core affective state. When core affect is in the foreground of consciousness, it is experienced as a personal reaction to the world: we like or dislike a drink, a person, or a painting. It is at these times that feelings which can be described as pleasant or unpleasant content with some degree of arousal can serve as information for making explicit judgments and decisions (Clore et al., 2005; Schwarz & Clore, 1983).

Finally, we hypothesize that the validity of experience is rooted in core affect. Core affect gives force to our attitudes and beliefs, and provides a sense

that what we know is what is right or correct. It seems plausible, then, that core affect would contribute to confidence in our beliefs about political topics (e.g., global warming, abortion, etc.), our world view (e.g., belief in a just world, or in basic moral principles), or even form the core of religious faith (e.g., a strong affective response is how you believe in something that cannot be seen). It is no surprise, then, that the most affectively loaded topics are the ones that produce the most steadfast opinions, even in the face of contrary evidence.

4. THE AFFECTIVE CIRCUMPLEX: A DESCRIPTIVE TOOL FOR REPRESENTING THE NATURE OF CORE AFFECT

A person's momentary core affective state (whether it is a simple feeling, part of an emotion, or part of perceiving an image or another person's face), realized by such complex circuitry in the anterior parts of the human brain, can be psychologically described and represented by a single point on the two dimensional space schematically represented in Fig. 4.3. Many readers will recognize this structure as the affective circumplex (Barrett & Russell, 1999; Feldman, 1995b; Russell, 1980; Russell & Barrett, 1999). The horizontal dimension, hedonic valence, ranges from pleasant states at one end to unpleasant states at the other. The vertical dimension, arousal, ranges from high activity and attention at one end to low activity and sleepiness at the other. Both dimensions are descriptively bipolar (for a discussion, see Russell & Carroll, 1999) and largely independent from one another, meaning that arousal is not merely the intensity of pleasure or displeasure (Kuppens et al., in preparation). In this section, we describe how the circumplex can be used as a research tool for studying the content of core affective states.

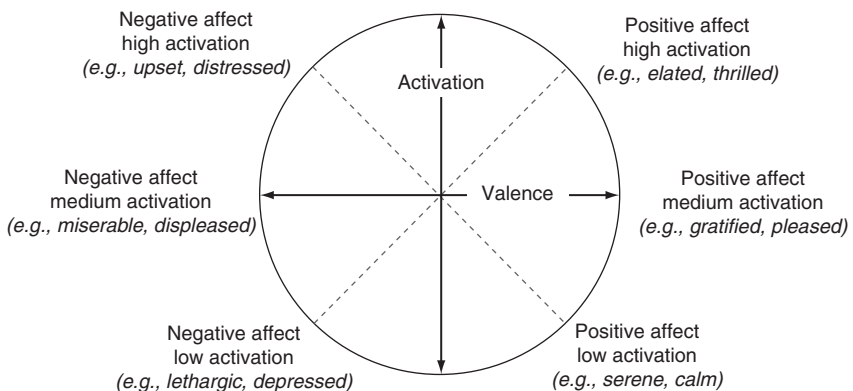


Figure 4.3 The affective circumplex. Hedonic valence is represented on the horizontal axis and arousal on the vertical axis.

4.1. Deconstructing the affective circumplex

In the most general terms, a circumplex structure is a multipurpose, mathematical tool for representing mental structure through the geometry of the circle (Guttman, 1957). The mental structure can be for any group of objects, items, or stimuli and is assessed by measuring people's responses to them. For example, researchers typically measure judgments of affect-related words, perceptual judgments of faces depicting emotion, or self-reports of a person's own momentary feeling state. To create a circumplex, the relations between the judged or rated stimuli are rendered in multidimensional space.

In simple terms, a circumplex, such as the circumplex model of affect, is a circle and a set of axes. The circle depicts the similarity or relatedness between the objects (based on people's psychological responses to them). The axes represent the psychological properties that quantify what is similar and different about people's reactions to those objects.

4.1.1. The circle

Most objects in the world are similar to one another (or different from one another) in more than one way. For example, in the interpersonal domain, people differ from one another based on their nurturance (how warm and giving they are) and dominance (the extent to which they prefer to be controlling the outcome of others vs. being controlled by them (Wiggins & Broughton, 1991). Using the terms of psychological measurement, we would say the interpersonal descriptions are *heterogeneous*—two people cannot be compared to one another using only one property (nurturance) because they simultaneously vary on the other (dominance) as well. If we only compare along only one dimension, we will be making a specification error (leaving some meaningful variance unaccounted for).

When projected into geometric space (using some kind of factor analysis or multidimensional scaling), heterogeneous objects take on a circular shape (Guttman, 1957). In fact, circularity is a kind of statistical test for the descriptive nature of the objects in question. The term “circumplex” literally means “circular order of complexity” to indicate that the psychological objects or events in question are simultaneously similar or different from one another on at least two more basic psychological properties and therefore cannot be easily ordered relative to one another in a simple linear fashion. When objects are homogeneous, and best described by one and only one property, then a circular structure would not appear (instead, when projected into geometric space, would see something more like Thurstone's simple structure).

When projected into geometric space, measurements of affect almost always take on a circular shape (for a review, see Russell & Barrett, 1999).⁷

⁷ For ease of explication, we will refer to words, pictures, or faces as “affective objects” to denote their ability to change a perceiver's affective state; or to denote their reflection of that change, as in self-reports of emotion experience.

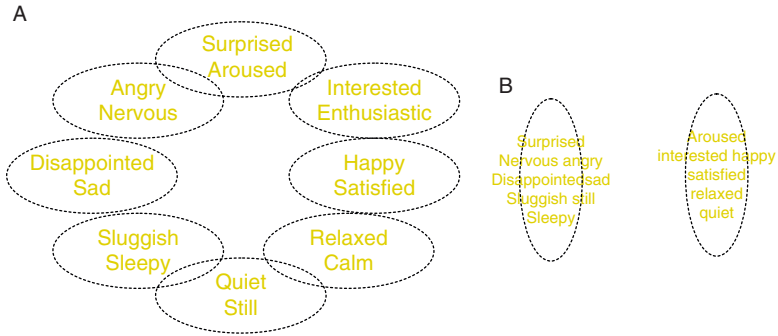


Figure 4.4 Variations in the affective circumplex. (A) depicts a prototypical affective space insofar as emotions are distributed evenly in a circular structure, with many smaller regions of homogeneity, where each region is psychologically distinct from every other. (B) depicts a nonprototypical affective space with two larger regions, where emotions within a region are highly similar. Figure is adapted from Barrett (2004).

The fact that they arrange in a circular fashion with such regularity reveals that affective objects (be they judgments of words, pictures of faces, or self-report ratings of experience) are similar or different from one another in more than one way (and therefore must be described by more than one fundamental property). For example, both structures in Fig. 4.4 depict circumplex structures of affect in geometric space. The similarity between affective objects is represented solely by their position in the circle. This similarity might be the result of two properties, or three, or even four—the point is there is more than one.

The affective circumplex has an additional feature, over and above a generic circular structure. The qualitative (or ordinal) similarity for two affective objects is reflected in their proximity to one another around the perimeter of the circle. Affective objects that are closer together are more similar, whereas elements separated by an arc distance of 180° are maximally dissimilar (but for an alternative view, see Plutchik, 1980). For example, as the minimal arc distance between elements increases (e.g., “happy” and “enthusiastic”), the degree of similarity decreases (i.e., the correlation becomes smaller), suggesting that the elements are experienced as qualitatively different. Affective objects are separated by an arc distance of 90° (e.g., “happy” and “surprised”) are completely independent. As the arc distance increases to 180° (e.g., “happy” and “sad”), the objects represent bipolar opposites. Past 180° , the objects become increasingly similar again until the original starting point is reached. Over and above these constraints though, objects within space need not be equally spaced around the circle for it to be considered a circumplex (Browne, 1992; Fabrigar et al., 1997; see also Segura & González-Romá, 2003).

4.1.2. The axes

As conceived by Guttman (1957), the circumplex was defined solely in terms of ordinal relationships and so, alone, does not allow a quantitative analysis of the features or properties that psychological responses share—it merely depicts their nonparametric relatedness in geometric space. As is true for some (but not all) circumplexes, it is necessary to embed the affective circle within a two dimensional Euclidean space to discover the multiple properties that best describe how its elements are similar (or different) from one another (see Shepard, 1978). The dimensions represent the salient psychological attributes or features that describe the psychological responses (Davison, 1983). In the affective domain, the specific nature of those attributes has been an issue of great debate for the last half a century.

4.2. Anchoring the affective circumplex

Although valence and arousal are the original set of dimensions that anchored the affective circumplex, other sets of dimensions have been proposed (see Fig. 4.5), including *positive* and *negative activation* (e.g., Watson & Tellegen, 1985; Watson et al., 1999), *positive* and *negative affect* (Cacioppo et al., 1999), *approach* and *withdrawal* (e.g., Davidson, 1992), and *tense* and *energetic activation* (Thayer, 1989). In fact, all dimensions can be incorporated within the same circular structure (Carroll et al., 1999; Yik et al., 1999; Fig. 4.6). Still, there have been long debates about which dimensions are the most scientifically useful, with arguments on all sides (for reviews, see Cacioppo et al., 1999; Green et al., 1999; Russell & Barrett, 1999; Watson et al., 1999). A brief discussion of these arguments highlights some important points about the nature of affect.

4.2.1. The great bipolarity debate

One issue that has drawn a good deal of attention is whether a bipolar valence dimension can properly describe affective states. Most typically, this question is asked in terms of whether pleasure and displeasure are truly bipolar opposites. Many studies (relying almost exclusively on zero-order correlation coefficients) have demonstrated that people report feeling both pleasant and unpleasant affective feelings “at the same time,” so that the correlation between the two is nowhere near -1 (which is assumed for bipolar opposites).

When measurement errors are properly controlled, subjective ratings of pleasure and displeasure are strongly negatively correlated (Barrett & Russell, 1998; Green et al., 1993). But to emphasize these negative correlations is to miss the more central point that correlations are statistically inadequate for evaluating bipolarity. Mathematical proofs clearly show that a correlation of -1 is not the gold standard for demonstrating bipolarity (Russell & Carroll, 1999;

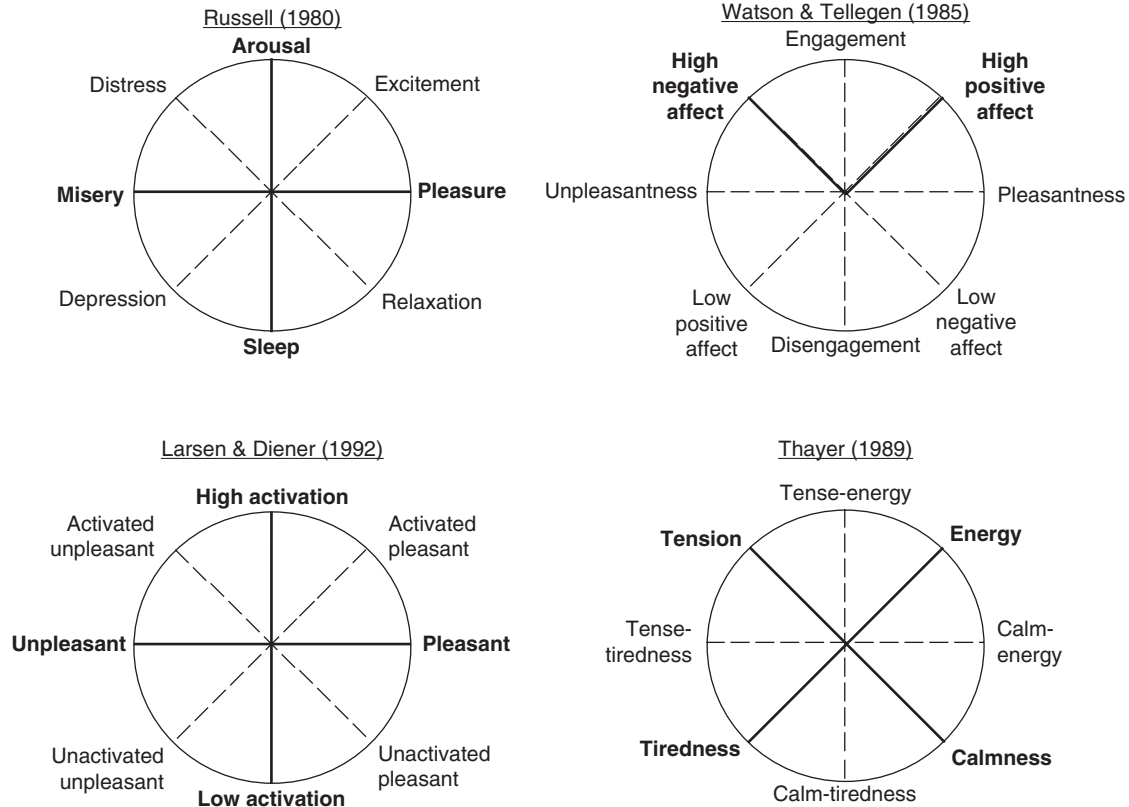


Figure 4.5 Multiple affective dimensions mapped in circumplex space. Primary (or main) dimensions are indicated in with black solid lines and labeled with capital letters. Secondary dimensions are indicated with gray dotted lines and are labeled in lower case letters. From Barrett and Russell (1999).

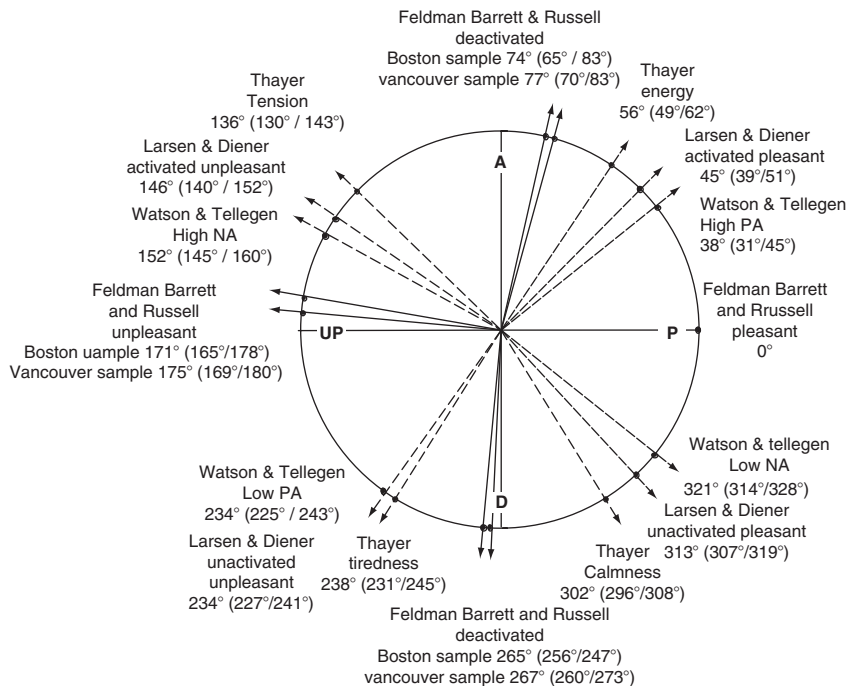


Figure 4.6 A circumplex representation of various affective dimensions plotted according to a CIRCUM analysis. The Russell/Barrett, Larsen/Diener, Thayer, and Watson/Tellegen affective dimensions were measured using separate scales and their position in circular space was estimated using a structural equation modeling program (CIRCUM) that was specifically designed to estimate circumplexity. From Yik et al. (1999).

see also Segura & González-Romá, 2003). This is because the predicted correlation between true bipolar opposites with error-free data, when each is measured on an unambiguous unipolar format Likert-type scale (e.g., “neutral” = 0, “happy” = 6), equals the unintuitive number $-.467$. This value is based upon assumptions about L-shaped bivariate response distributions (Russell & Carroll, 1999). Item response theory analyses places the correlation for bipolar opposites closer to $-.392$ (Segura & González-Romá, 2003). Whether the actual value is $-.467$ or $-.392$, the point is that zero-order correlations cannot be unambiguously interpreted as supporting either bipolarity or bivalence (independence between pleasure and displeasure). When correlations are more negative than $-.467$, it is usually the result of systematic measurement error (for a full discussion, see Russell & Carroll, 1999). Consequently, correlational techniques (and statistical methods based on those techniques, such as factor analysis) should never be used to provide evidence for which set of dimensions best anchors the circumplex (cf. Russell & Carroll, 1999; Schimmack, 2001; Schimmack et al., 2002), although scientists routinely ignore this advice and continue to use them for this purpose.

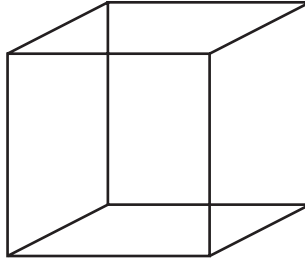


Figure 4.7 The “Necker” cube illusion.

Furthermore, it is not clear what “at the same time” actually means when a person reports feeling happy and sad at the same time. In the timeframe required to render a self-report rating or even a button-press, several different brain states could have occurred. This means that a single button press even when rendered very quickly in behavioral terms, is always a summary of a series of brain states. An equally plausible possibility, then, is that people do not experience two distinct feelings literally *at the same time*, but instead can alternate back and forth quickly between them, in much the same way that people do when looking the Necker cube illusion (see Fig. 4.7). In this illusion, it is possible to see two different percepts, but it is impossible to see them both at the same time. Instead, they alternate in quick succession. When asked how many configurations you see when you look at Fig. 4.7, you might say two (providing a summary of what you just saw), but you do not actually “see” them simultaneously. The same situation could be happening with affective states.⁸

Some scientists have criticized the valence/arousal model of affect on more causal grounds. Like Titchener, many scientists continue to believe that the descriptive structure of affect should be isomorphic with its causal structure, so that the best affective dimensions are those that are most causally plausible (i.e., the dimensions should reflect the processes that *cause* affective states). Accordingly, it has been claimed that certain dimensions (e.g., positive and negative affect) are more biologically basic, and therefore should be the preferred anchors of affective space (Ashby et al., 1999; Cacioppo et al., 1997, 1999;

⁸ Alternatively (and much more speculatively), it might even be possible for a person to be in both a positive and a negative state at the same time (in a probabilistic sense). Spivey (2007) argues that the human brain is rarely in a discrete state, and can be described by a fuzzy logic that allows many different states at once (each with some probability of reaching consciousness or causing action). When a certain threshold is crossed (or the probability of a given state is sufficiently high), the brain is said to be “in” that state, resulting in an experience (e.g., “having an positive affective experience” or “having a negative affective experience”) or a behavior (e.g., approaching or avoiding an object). Because the brain can configure itself into several different states in the time it takes to generate one motor response (to indicate a response choice, for e.g.), it is possible that positive and negative affective states, which bear no subjective resemblance to one another, are realized in neuronal assemblies that involve many of the same brain areas. Something (like attention) must bias processing to allow a motor output and/or consciousness of one or the other.

Reich et al., 2003). So far, however, the sorts of arguments that have been offered in this regard are problematic, for two reasons.

First, description and explanation usually occur at two different levels of analysis. In the end, a description of psychological content will rarely ever shed light on the processes that caused it, in much the same way that the experience of the sun rising and setting is not evidence that the sun actually revolves around the earth (cf. Barrett, *in press*).

Second, many of the specific biological arguments that have been offered to support other sets of dimensions do not hold up under closer scrutiny. Most notable is the claim that positive and negative affective states are realized in anatomically different parts of the brain. Sometimes it is claimed that the amygdala is the locus of negative affect, whereas the ventral striatum is the locus of positive affect. As discussed already, neither claim is true. The amygdala is engaged in humans when viewing faces depicting positive expressions (Canli et al., 2002; Mather et al., 2004; Yang et al., 2002) as well as pleasant images (Garavan et al., 2001; Mather et al., 2004); animals with amygdala lesions show impaired stimulus-reward learning (Baxter & Murray, 2001; Baxter et al., 1999, 2000) and are less likely to self-administer rewarding drugs (Robledo & Koob, 1993). And work from Kent Berridge's lab (e.g., Reynolds & Berridge, 2001, 2002) has clearly shown that neurons in the ventral striatum also code for negativity.

Nor do positive and negative affect consistently show hemispheric specificity. The left dorsolateral prefrontal cortex may somehow support pleasant moods, reactions to pleasant stimuli (e.g., pleasant film clips), and approach behaviors, whereas the right supports unpleasant moods, reactions to unpleasant stimuli (e.g., unpleasant film clips), and withdrawal behaviors (for reviews see Davidson, 1992, 1993, 2004), but this laterality does not extend to other parts of the prefrontal cortex. For example, our own recent meta-analysis of neuroimaging studies of affect and emotion found exactly the opposite lateralization for pleasant and unpleasant affective experiences (particularly in the orbital sector of prefrontal cortex) with positive affective experiences corresponding relatively greater activation on the right and negative experience to relatively greater activation on the left (Wager et al., 2008; see Fig. 4.8). A meta-analysis by Kringebach and Rolls (2004) localized positive affect medially and negative affect laterally within the OFC of both hemispheres (with no differences in lateralization).

It is sometimes claimed that positive and negative affective states rely on different neurotransmitter systems (dopamine and serotonin, respectively), but this, too, is debatable. Dopamine is not a reward transmitter (for reviews, see Salamone et al., 2005). Increases in dopamine are observed in rats occur during aversive events, such as tail pinches (Bertolucci-D'Angio et al., 1990), foot shocks (Sorg & Kalivas, 1991; Young et al., 1993), and cold ice baths (Keller et al., 1983). Similarly, serotonin is not a distress

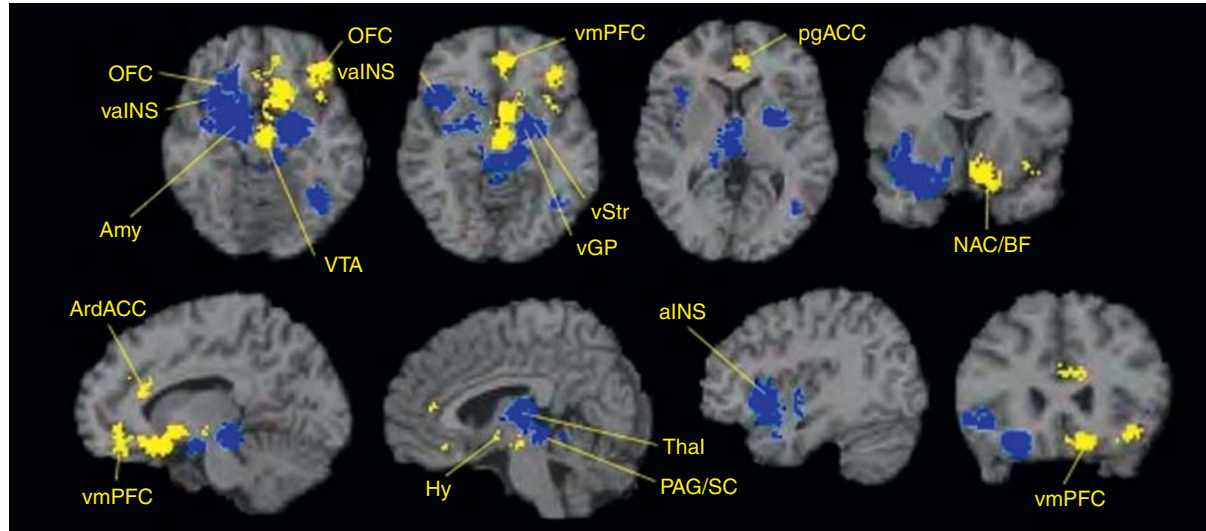


Figure 4.8 Brain areas consistently activated for positive (yellow) and negative (blue) affective experiences. OFC = orbitofrontal cortex; vaINS = ventral anterior insula; Amy = amygdala; vStr = ventral striatum; vGP = ventral globus pallidus; pgACC = pregenual anterior cingulate cortex; rdACC = rostral dorsal anterior cingulate cortex; vmPFC = ventromedial prefrontal cortex; Hy = hypothalamus; Thal = thalamus; PAG/SC = periaqueductal gray/superior colliculus; aINS = anterior insular. From Wager et al. (2008). (See online version of the chapter for color figure).

neurotransmitter and has been linked to changes in positive affect as well (Barge-Schaapveld et al., 1995; Dichter et al., 2005; Zald & Depue, 2001). Both dopamine and serotonin are what has been called “neuromodulators” in the sense that they originate in the brainstem’s ascending arousal system and tune the firing rates of many different neuronal groups throughout the cortex. Dopamine from both the substantia nigra and ventral tegmental area mark the salience of an event and are important to regulating access to voluntary motor outputs during motivated, effortful behavior; serotonin from the rostral raphe nucleus reduces distractibility and gates the processing of motivationally relevant sensory cues (Mesulam, 2000; Parvizi & Damasio, 2001).

Based on our read of the evidence, valence and arousal are best thought of as the *descriptive features* of core affect that bear no resemblance to or inform about how affect is caused. Simply put, content does not necessarily tell us anything about process. This means that the structure of felt experience will not correspond to the brain processes that produced those experiences in a one-to-one fashion. It also means that brain structure will not necessarily inform us about which psychological dimensions are best suited to anchor the affective circumplex. Nonetheless, as we demonstrate later in this paper, descriptions can be scientifically useful.

4.2.2. Replicability across affective domains

Wundt’s original properties of hedonic valence and arousal are most replicable across different domains of psychological response (Barrett & Russell, 1999; Russell & Barrett, 1999), and therefore seem to be the best dimensions to anchor the affective circumplex as a *descriptive* tool. In this section, we briefly review the evidence that judgments of emotion-related language, judgments of facial behaviors, and subjective ratings of emotional episodes, such as anger, sadness, and fear, as well as nonemotional affective states (like fatigue, sleepiness, and placidity) can all be minimally characterized as a combination of hedonic valence and arousal. Other dimensions, such as positive and negative activation, have been identified only for the self-reports of experience, and not for judgments of words or faces.

4.2.3. Judgments of faces

Judgments of emotion in other people’s faces configure as a circumplex that is described by valence and arousal properties. Woodworth (1938) described classification judgments of “facial expressions of emotion” (i.e., emotion caricatures) as well as “judgment errors” (i.e., failures to give the consensual response) using valence and arousal dimensions. Schlosberg (1952) found something similar as well, describing a circular mapping of affect defined first by two dimensions (pleasantness–unpleasantness, attention–rejection), following which he added an intensity dimension (sleep–tension) to produce a cone-like structure (Schlosberg, 1954). Circumplex structures have been identified in perceptions of facial depictions of emotion (e.g., Abelson &

Sermat, 1962; Cliff & Young, 1968; Dittman, 1972; Fillenbaum & Rapoport, 1971; Green & Cliff, 1975; Russell et al., 1989; Schlosberg, 1952, 1954; Shepard, 1962a,b), both in adults and in children (Russell & Bullock, 1985; Russell & Ridgeway, 1983). Very young children only seem to make distinctions between facial depictions of pleasant and unpleasant, however (Widen & Russell, 2003).⁹ Furthermore, event-related potential (ERP) studies general confirm that hedonic valence (and perhaps arousal) is coded early during face perception (as early as 80 ms, but typically between 120 and 180 ms after stimulus onset depending on whether the face is presented fovially or parafoveally; for reviews, see Eimer & Holmes, 2007; Palermo & Rhodes, 2007; Vuilleumier & Pourtois, 2007). Recent neuro-imaging evidence also supports the idea that valence is a basic aspect of face perception (e.g., Engell et al., 2007; Todorov, 2008).¹⁰

4.2.4. Judgments of words

Multidimensional scaling analyses of similarity judgments (estimates of relatedness) of emotion-related words routinely yield valence and arousal dimensions. Here, valence and arousal represent the basic, semantic properties contained in cognitive maps of emotion language (Barrett & Fossum, 2001; see Fig. 4.9). Circumplex structures anchored by valence and arousal dimensions have been reliably derived from similarity ratings for different sets of affect terms (Barrett, 2004; Block, 1957; Bush, 1973; Feldman, 1995a; Russell, 1980; also, see Fig. 4.10) indexing emotion language in many different cultures (Russell, 1991). These findings are consistent with the semantic differential work by Osgood et al. (1957) who demonstrated that there are three major components of meaning in natural language (evaluation, activity, and potency).

⁹ Contrary to popular belief, studies do not conclusively demonstrate that infants distinguish between discrete emotion categories. Infants categorize as distinct faces with different perceptual features (e.g., closed versus toothy smiles) even when they belong to the same emotion category (Bornstein & Arterberry, 2003) and no studies can rule out the alternative explanation that infants are categorizing faces based on the valence, intensity, or novelty (especially in the case of *fear*) of the facial configurations. For example, infants look longer at *fear* (or *anger* or *sad*) caricatures following habituation to *happy* caricatures, but this may reflect their ability to distinguish between faces of different valence (e.g., Flom & Bahrick, 2007). Similarly, infants look longer at a *sad* face following habituation to *angry* faces (or vice versa), but infants may be categorizing the faces in terms of arousal (e.g., de Rosnay et al., 2004, Experiment 3). Many studies find that infants tend to show biased attention for *fear* caricatures (e.g., Flom, & Bahrick, 2007), but this is likely driven by the fact that infants rarely see people making these facial configurations.

¹⁰ Although affect is a basic aspect of face perception, it is most likely a learned aspect. For example, in a recent case study, an individual recovering from blindness (following a corneal transplant) could not tell the difference between happiness and sadness in faces that were unfamiliar to him. This problem persisted for several years after he was able to receive visual stimulation in early visual brain areas.

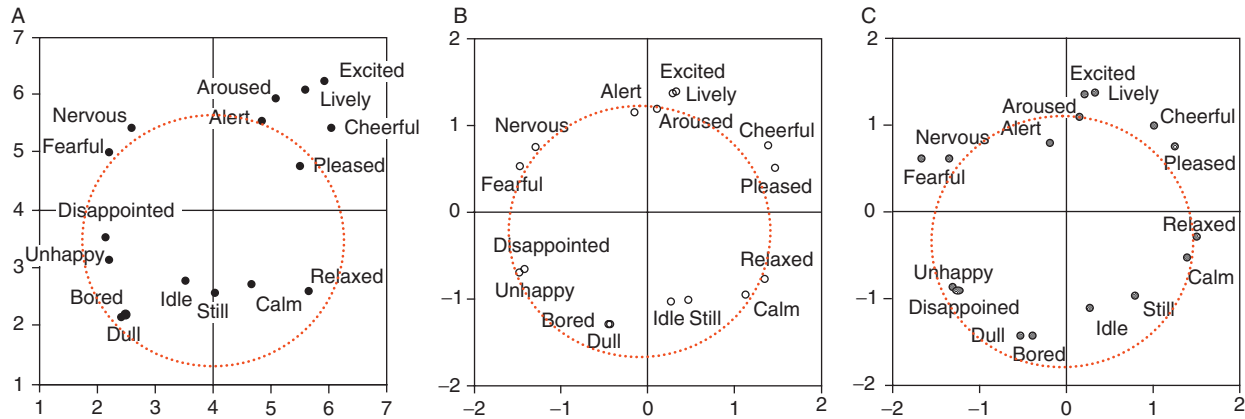


Figure 4.9 Cognitive maps of affective space. The circumplex structure of affect derived from direct semantic ratings, similarity judgments, and conditional probability judgments of emotion words. Based on data from Barrett and Fossum (2001).

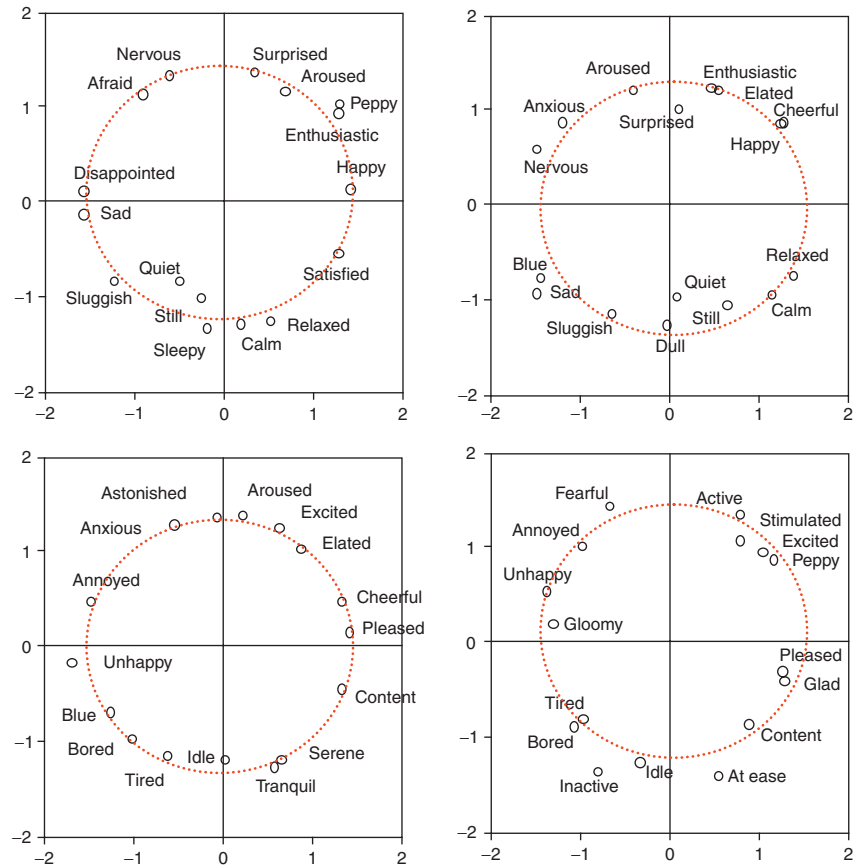


Figure 4.10 Affective circumplex structures estimated from multidimensional scalings of similarity judgments using different sets of emotion adjectives (Barrett, unpublished data).

4.2.5. Self-report ratings of experience

Ratings of subjective ratings of emotion experience also configure into a circumplex described by valence and arousal. Self-reports of emotion experience taken from a group of individuals at one point in time configure into a circumplex shape anchored by valence and arousal dimensions (Feldman, 1995b; Russell, 1980; Yik et al., 1999; for a review, see Barrett & Russell, 1998; Russell & Barrett, 1999) (see Fig. 4.11). So do idiographic reports that are taken over time and modeled separately for each person (Barrett, 1998, 2004; Feldman, 1995a; Fig. 4.12; see next section for a more detailed description). People are also able to give an explicit account of core affective feelings using a variety of self-rating scales (Barrett & Russell, 1998;

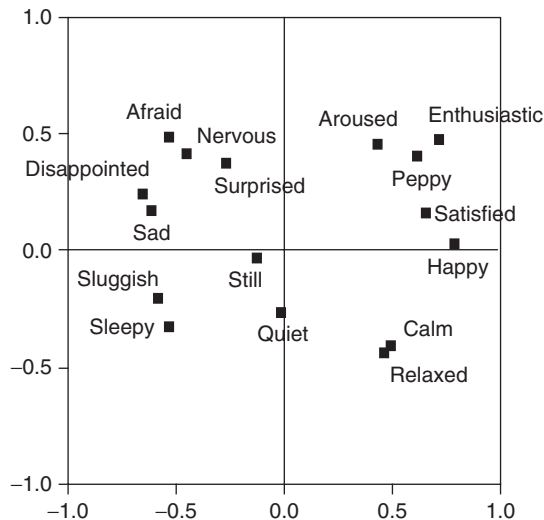


Figure 4.11 Cross-sectional ratings of emotional experience modeled as a circumplex. Factor loading plot for ratings of emotional experience taken using 16 adjectives. Valence is represented as the horizontal axis and arousal as the vertical axis. Taken from Feldman (1995b).

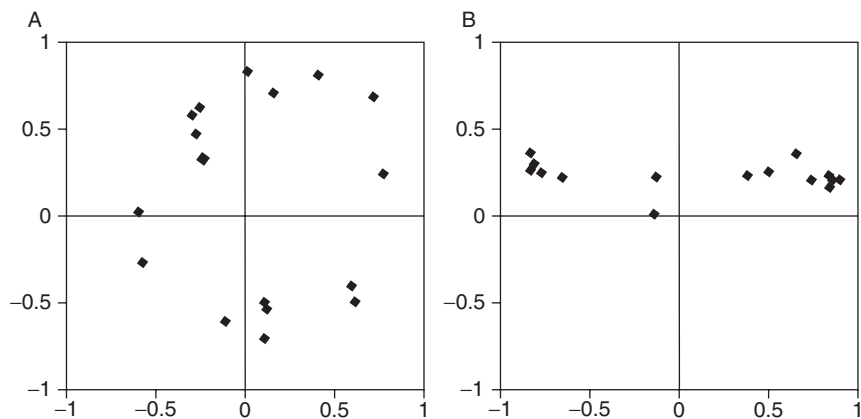


Figure 4.12 Idiographic variation in circumplex structure. Examples of idiographic affective circumplexes derived from momentary ratings of emotional experience for two participants. The participant depicted in (A) has a relatively prototypical circumplex with many small regions of homogeneity which reflects high emotional granularity. The participant in (B) has a flatter, more elliptically shaped circumplex which reflects low emotional granularity. Figure reprinted from Feldman (1995b).

Bradley & Lang, 1994; Carroll et al., 1999; Frijda et al., 1989; Kitayama et al., 2000; Lang et al., 1993; Roseman et al., 1996; Russell et al., 1989; Scherer, 1997; Smith & Ellsworth, 1985, 1987; Yik et al., 1999).

All humans, it seems, can tell the difference between a pleasant affective state and an unpleasant affective state. Many, but not all, people also characterize their affective states as high or low in activation. In these studies, valence and arousal dimensions did not reflect the artificial influence of language (for evidence, see Barrett, 2004, 2006b) nor social desirability (Barrett, 1996). Instead, valence and arousal represented the content of experience. In the next section, we discuss how the affective circumplex can be used to model individual differences in the phenomenological experience of valence and arousal.

5. INDIVIDUAL DIFFERENCES IN CORE AFFECT

For about a decade, our lab used a range of experience-sampling procedures to observe how people reported their emotion experiences (using simple English words for emotion) in the course of everyday life over several weeks. Primarily with the use of the palm-top computers, we observed hundreds of people reporting their experiences over many occasions. We then treated those reports as verbal behaviors and constructed an affective circumplex structure for each person. We observed significant variation in affective structure across people, and with the use of some novel multivariate techniques (outlined first in Feldman, 1995a), revealed individual differences in core affective experience that was linked to broader differences in the granularity of emotional life.

Within the affective structure for a given person, a *local region of homogeneity* formed when reports of two experiences are relatively close over time (e.g., “happy” and “satisfied”). Very high correlations reflected the fact that experiences were descriptively similar and are phenomenologically indistinguishable. People whose verbal behaviors produced a prototypical circumplex with a uniform, circular structure show many small regions of homogeneity across the circle. This means that they had many precise domains of experience that were descriptively distinct from one another (like that depicted in Fig. 4.4A; for an example of actual data, see Fig. 4.12A). These individuals were said to be high in *emotional granularity* because they used different adjectives to represent distinct kinds of experience (e.g., anger and sadness are phenomenologically distinct).

People who produced a structure that is flatter and more elliptical in shape show a small number of broad regions of homogeneity and correspondingly fewer domains of distinct experience (e.g., see Figs. 4.4B and 4.12B). These individuals were lower in emotional granularity, because

even though they were using the same set of adjectives to report their experience (as were those higher in emotional granularity), they used these terms to represent only a few general feeling states. For example, they might use words like “angry,” “sad,” and “afraid” to mean “unpleasant,” and words like “excited,” “happy,” and “calm” to mean pleasant. Less frequently, we observed people who use arousal words interchangeably, so that “excited” and “nervous” are experienced as phenomenologically similar, as are “tired” and “calm.”

Individual variation in emotional granularity (represented by the shape of the circle) could be quantified in terms of the emphasis that an individual placed on the hedonic and arousal properties of core affect when reporting his or her experience. Estimating the emphasis (or focus) on valence was accomplished by computing the proportion of variance in the verbal reports of emotion experience due to the valence-based meaning of the words (for a step by step description of the process, see Barrett, 2004; Feldman, 1995a). The emphasis (or focus) on arousal was estimated by computing the proportion of variance in the verbal reports due to the arousal-based meaning of the words. In this procedure, then, the emphasis on core affective properties was measured directly from behavior (as opposed to asking people to report how much they focus or emphasize each feature).

The more that valence-based meaning of the words accounts for variance in the reports of actual experience, the more an individual emphasizes or focuses on valence during the reporting process. *Valence focus* (VF) represents the amount of information about pleasure or displeasure contained in verbal reports of emotional experience. It does not represent the tendency to report pleasant states, or unpleasant states, but rather reflects the extent to which hedonic valence is an important descriptive property of core affective responding in that individual. Individuals high in VF emphasize pleasure and displeasure in the content of their verbal reports more than do those lower in VF, often at the expense of other properties of affect, like arousal (Barrett, 2004).

Similarly, *arousal focus* (AF) represents the amount of information about felt activation or deactivation contained in those verbal reports. It does not represent the tendency to report high arousal states, or low arousal states, but rather it reflects the extent to which arousal is an important descriptive property of core affective responding in that individual.

Individuals high in emotional granularity, with perfectly circular affective structures, experienced core affective states that were equally hedonic and arousal-based ($VF = AF$). In Fig. 4.13, VF is plotted against AF for almost 700 participants who have participated in our experience-samplings studies. Respondents who fell around the diagonal displayed circular affective structures. Individuals lower in emotional granularity, with elliptical structures experience core affective states that were relatively more hedonic ($VF > AF$) fell below the diagonal. These individuals had difficulty

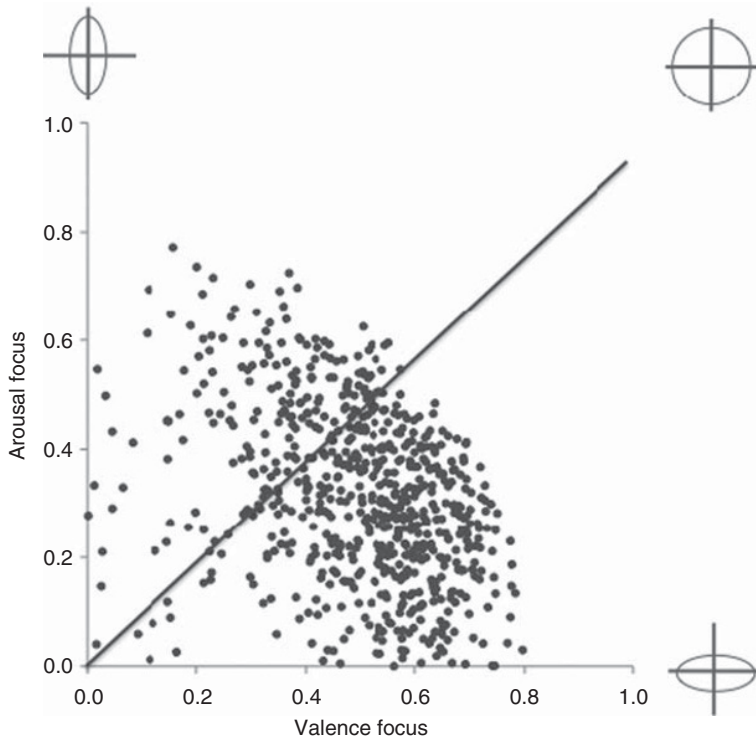


Figure 4.13 Scatterplot of variation in valence focus and arousal focus. Valence focus plotted against arousal focus for ~700 subjects who completed experience sampling experiments in our laboratory over a 10-year period. Caricatured circumplex structures are plotted on the extremes of the axes. Participants who fall along the diagonal line (where $VF = AF$) are high in emotional granularity and have a prototypical circumplex structure. Participants who fall above the diagonal like ($AF > VF$) and below the diagonal line ($VF > AF$) are less granular and have more elliptical shaped circumplex structures.

distinguishing between negative states that differed in arousal (such as anger and sadness); the same was true for positive states. Those whose affective states were relatively more arousal-based ($AF > VF$) fell above the diagonal, and had difficulty distinguishing between high arousal states that differed in hedonic valence (such as nervousness and excitement); the same was true for low arousal states.

Individual differences in both VF and AF relate to other psychological phenomena in a way that establishes their construct validity. For example, people who are more valence focused are also more perceptual sensitive to hedonic information in the face of another person (Barrett & Niedenthal, 2004). Using a Morph Movies task, participants were presented with a series of movies in which actors began with neutral facial expressions and gradually, over the course of one hundred frames, began to express happiness, sadness,

or anger. Participants advanced each movie using a cursor at the bottom of the screen and were instructed to stop the cursor at the point at which they first detected any feeling on the actor's face. Heightened levels of VF predicted earlier detection of the appearance of affective expressions, suggesting that people high in VF have enhanced perceptual sensitivity to valenced information in the environment. People high in VF also described themselves as being more sensitive to hedonic cues, as indexed by reports on a variety of traditional personality measures (e.g., neuroticism and extraversion) (Barrett, 2006c).

Increased sensitivity to hedonically evocative cues has real-world importance for the lives of people high in VF. People high in VF experience a life as a rollercoaster ride filled with drama. They experience a world that is saturated with hedonic value because their threshold for detecting and responding to such cues is comparatively lower than people who are low in VF. We verified this hypothesis in another series of experience sampling studies where we examined the extent to which VF was linked to self-esteem lability. In two event-related experience-sampling studies, participants reported on their social interactions over either a week or two-week period. During each sampling moment, participants reported on their emotional experiences (using the methodology from previous studies and therefore allowing for the computation of VF), their self-esteem at the moment of sampling, and the valenced information in the social interaction (e.g., the amount of positive or negative emotion expressed by the interaction partner(s)). Lability in self-esteem was measured behaviorally in hierarchical linear modeling analyses, as the magnitude of the self-esteem change when faced with positive and negative cues during social interactions. As predicted, individuals who were more valence focused also demonstrated more self-esteem lability—their self-regard was like a ping-pong ball, bouncing around from interaction to interaction (Pietromonaco & Barrett, manuscript under review). People high in VF are not *simply* perceiving more hedonic information in their environments—they are using that information to shape and change their sense of self.

AF, on the other hand, is related to an enhanced sensitivity to one's own physical state (Barrett et al., 2004). Participants completed a modified Whitehead heartbeat detection task (Whitehead & Drescher, 1980) during which they were asked to judge whether a series of tones were either in sync or not in sync with their heartbeats. These data were then subjected to a signal detection analysis yielding an index of interoceptive sensitivity. In two studies, people who were higher in AF showed enhanced sensitivity to their own heartbeats. These findings indicated that people who have more awareness of the internal sensory cues coming from their body also experience more variation in the arousal-based property of core affect. They clearly showed that people can, at times, detect specific information in their bodies, and this sensitivity is, in some way, related to the experience of emotion.

Furthermore, the AF-interoception link helps to clarify the relation between interoceptive sensitivity and emotional experience. Most studies have examined the link between heartbeat detection and explicit ratings of the intensity of emotion experience, with inconsistent results (Critchley et al., 2004; Ferguson & Katkin, 1996; Hantas et al., 1982; Wiens et al., 2000). In most studies, respondents rated their experience on a Likert-type scale using a set of adjectives, and those ratings were summed to derive an index of experienced emotion. It is possible; however, that interoceptive sensitivity is better conceptualized as relating to the perception of arousal as a property of experience, rather than to the intensity of experience *per se*. The feelings of activation and deactivation arising from interoceptive cues may be too impoverished to reliably influence direct, consciously available explicit ratings of emotion. Instead, these background interoceptive cues may manifest in a focus on activation-based aspects of emotional states in a more indirect or nonexplicit way. Presumably, individuals who are more interoceptively sensitive would be more likely to perceive feelings of arousal, and would communicate those feelings in self-report process over time, even if such differences are not apparent in the intensity of explicit reports.

Moreover, the relation between AF and interoceptive sensitivity not only provided validity for the link between interoceptive sensitivity and experienced emotion, but they also provided much needed incremental validity for self-reports of emotional experience more generally. By demonstrating that AF was related to interoceptive sensitivity, we were able to demonstrate that information implicitly contained in self-report ratings (i.e., the extent to which people focus on a property of their experience when reporting it) was associated with a behavioral variable (heartbeat sensitivity). This is a different sort of validity than showing that the levels of self-reported emotional experience (e.g., participants' ratings of anger, pleasure, etc.) correlate with behavioral or psychophysiological measurements. In addition, many of the studies that provide validity evidence for self-reports of emotional experience examine concurrent relationships between self-reports and validity variables. In contrast, we demonstrated that AF was linked to interoceptive sensitivity when the measurements of each were separated by several weeks time.



6. FUTURE DIRECTIONS

Taken together, both psychological and neuroscience evidence supports the conclusion that core affect is a basic psychological ingredient in emotion. Studies examining the circumplex structure of affect demonstrate that core affect is a multiproperty phenomenon, and the structure is robust

enough to accommodate many different ways of describing affect. Furthermore, the structure is able to represent meaningful individual differences in affective focus and link them to patterns of variation in emotional experience.

More recently, our lab has focused its attention on the hypothesis that core affect is a basic psychological ingredient of mental life more generally. The neuroanatomical studies mapping affective circuitry strongly suggest that core affect plays a formative role in other psychological phenomena that fall outside the traditional boundaries of emotion. In the past several years, we have been investigating role of core affect in two such processes: learning and vision.

6.1. Core affect supports learning

To survive, a person must know to avoid threat and danger and approach reward and nourishment. A person must be able to navigate through the world using affective reactions as a guide. Such navigational skills are critical not only in the physical world (e.g., knowing to avoid a poisonous snake in the desert), but also for survival in the social world (e.g., knowing to avoid a person who has not proven trustworthy in the past). Very few objects and situations (and even fewer people) have the *innate or intrinsic* power to perturb another person's core affect. Instead, humans (like all living creatures) must learn what to approach and what to avoid, what to desire and what to ignore. Core affect supports this kind of learning, which we call *affective learning*.

Affective learning occurs when a stimulus that does not have the capacity to perturb core affect (what colloquially would be called a "neutral" stimulus) acquires that capacity on future occasions. Stimuli acquire affective value by being paired with other stimuli that change in a person's core affective state. When the two stimuli are paired across a number of experiences, the neutral stimulus begins to itself elicit changes in core affect. In this way, a neutral stimulus is said to have acquired affective value. Examples of associative affective learning include Pavlovian or classical conditioning (i.e., where neutral stimuli are paired with stimuli that cause robust sympathetic nervous system (SNS) reactions; for reviews, see, Delgado et al., 2006; Domjan, 2005; Pearce & Bouton, 2001) and evaluative conditioning (i.e., where neutral stimuli are paired with stimuli that are explicitly evaluated to be liked (or good) or disliked (or bad); for reviews, see De Houwer et al., 2001; Field, 2005). SNS activity is broadly implicated in affective responding (Cacioppo et al., 2000) and changes in people's SNS responses to a stimulus are taken as an indication that it has the capacity to perturb core affect.

In associative learning studies, affective learning is usually demonstrated by pairing human faces (e.g., Hermans et al., 2002) and pictures of geometric shapes (e.g., LaBar et al., 2004; Lipp et al., 2003) with stimuli

that have the capacity to perturb core affect, like high pitched and loud noises (e.g., Büchel et al., 1999; LaBar & Phelps, 2005) and electric shocks (e.g., Grillon, 2002; LaBar et al., 1998). So, for example, a neutral blue square acquires affective value by being paired repeatedly with an aversive (i.e., negative and arousing) electric shock. As it increasing comes to predict the presence of the shock, the blue square elicits the same affective response (typically indexed by SNS activation measured as electrodermal activity (EDA) on the surface of their fingertips). The larger the affective change, (presumably) the easier (and perhaps more robust) the affective learning.

An on-going line of work in our laboratory is investigating how individual differences in affective reactivity support individual variation in affective learning. In an associative learning experiment (Bliss-Moreau et al., manuscript under review), participants were presented with two neutral faces. One picture (the CS+) was consistently paired with a shock (the US) during an acquisition phase of learning, and the other picture was never paired with a shock (the CS-). When participants were shocked (i.e., presented with the US), they generated large sympatric nervous system responses measured as the magnitude of their EDA response. Over time and many pairings, participants began to respond with heightened EDA to the CS + face (paired with the shock) than to the CS - face (never paired with shock), and this response to the CS + face occurred even when the US was not presented (see Fig. 4.14A). With this pattern of findings, we demonstrated, like many other studies before us, that a neutral face acquired affective value and was able to change a person's affective state based on prior instances where it was paired with a stimulus that easily did so. Most importantly, we found that individual differences in affective reactivity predicted the magnitude of learning in this experiment. Individuals who demonstrated a perceptual sensitivity to affective value (assessed using the Morph Movies task that was related to VF in a prior experiment; Barrett & Niedenthal, 2004) also demonstrated enhanced affective learning. Specifically, as perceptual sensitivity increased, so too did the magnitude of the EDA response to the CS+. This learning effect was further enhanced for individuals who described themselves as high on neuroticism (itself an index of sensitivity to negative value) (see Fig. 4.14B). These findings provide some of the first results to show that individual differences in core affective reactivity are related to variation in negative affective learning.

Individual differences in core affective responding also predicted better rule-based affective learning (Bliss-Moreau et al., 2008). Rule-based affective learning occurs when the value of an object is communicated explicitly through symbolic means (e.g., telling someone that another person is threatening) rather than the object being paired in time or space with something of known affective value (as is the case for associative affective learning; for a discussion of rule-based vs. associative processing, see Sloman, 1996; Smith & DeCoster, 2000). We developed a rule-based

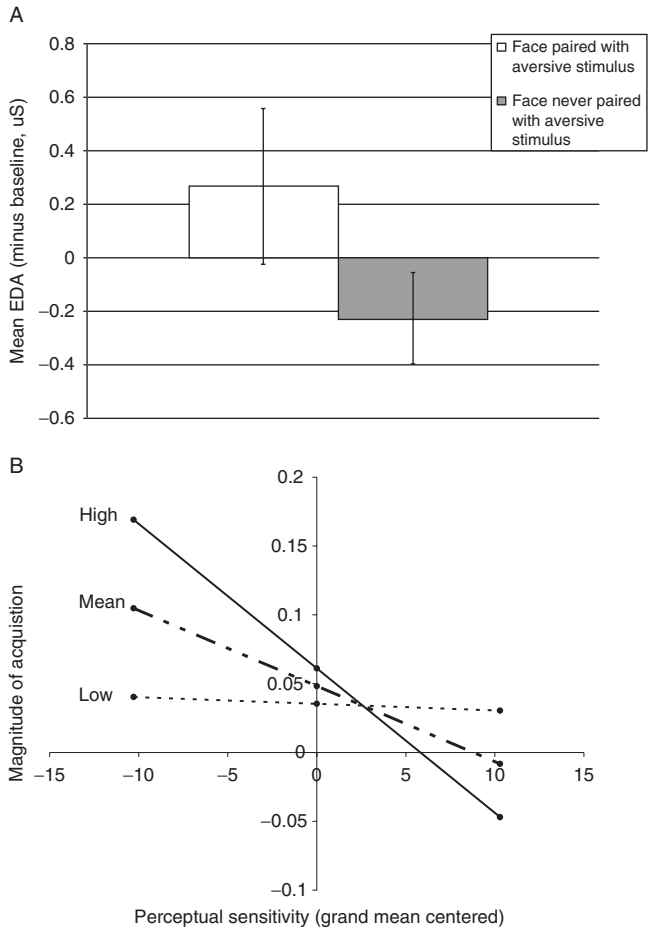


Figure 4.14 Variation in affective learning. Sympathetic nervous system response (as indexed by EDA) to face stimuli that were either consistently or were never paired with an aversive electric shock during an associative affective learning paradigm (A). The stimulus that was paired with a shock (CS+) acquired affective value as indicated by a significantly higher EDA response as compared with the EDA response to the stimulus that was never paired with shock (CS-). Individual differences in the acquisition of affective value were related to variation in affective reactivity (B). The relationship between perceptual sensitivity to affective value and the magnitude of affective learning is presented at three levels of neuroticism. From Bliss-Moreau et al. (manuscript under review).

affective learning paradigm using a modified spontaneous trait inference paradigm (e.g., Todorov & Uleman, 2002, 2003). Participants were asked to learn about the behavior of a series of target people. Participants were shown a series of 60 face target pictures, each of which was paired with a sentence describing a behavior during the learning phase of an experiment.

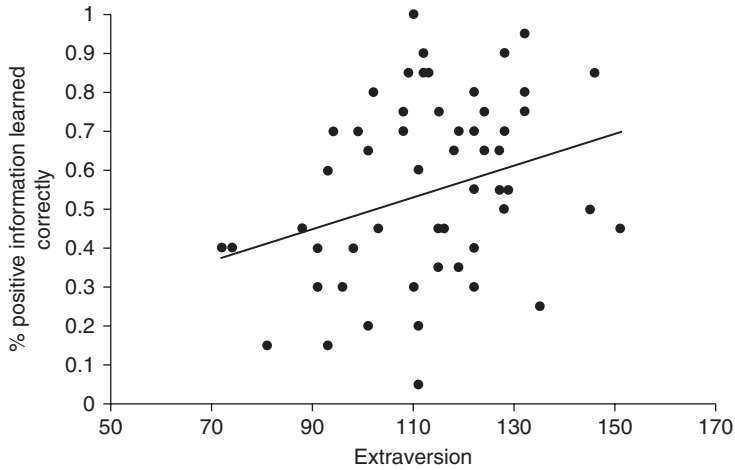


Figure 4.15 Individual differences in rule-based affective learning. Positive affective learning via rule-based means is predicted by participants' sensitivity to positive information and propensity to experience positive affect (as indexed by self-reported extraversion). Adapted from Bliss-Moreau et al. (2008, Study 3).

The behaviors were either positive (e.g., “celebrated a friend’s birthday”), negative (e.g., “hit a small child”), or neutral (i.e., “asked the cab driver for directions”) in affective tone. Participants were instructed to imagine the targets performing the behaviors described by the sentences. In a following test phase, participants made explicit judgments of the faces (presented without the sentences) as positive, negative, or neutral. More often than chance, participants categorized the faces according to the affective value of the sentence with which it had been paired during the prior learning phase. In addition, affectively positive learning was enhanced for people who described themselves as particularly reactive to positive affective value (as measured by extraversion). As self-reported levels of extraversion increased, so too did people’s propensity to categorize faces which had been paired with positive sentences as being positive (see Fig. 4.15).

Taken together, these findings suggest that both associative and rule-based affective learning are enhanced for people whose core affective states are often and easily perturbed. These findings have real-world implications for understanding how people come to have such different mental lives. As we noted earlier, people who are those high in VF surf a tumultuous sea of agony and ecstasy, and are easily moved or perturbed by changes in their surroundings. They often react to things that others find devoid of emotional meaning. Others (who are lower in VF) float in a sea of relative tranquility. They live their lives relatively undisturbed and they are generally less affected by the vicissitudes of life. They often do not react

to things that others find compelling or evocative, thereby missing events of potential import or significance. What begin as simple temperamental differences in affective reactivity may develop into these very different emotional lives (manifesting in different degrees of VF) because differences in reactivity support differential degrees of affective learning. In what might be considered a classic positive feedback loop, affective learning may proceed more robustly for a person who is more reactive to begin with. The person's world will become more populated with affectively evocative stimuli (because great numbers of previously neutral stimuli will presumably acquire value), so that the processing of those affective stimuli will serve to maintain shifts in core affect, which in turn promote enhanced affective learning. And so on. Thus, a person who experiences great reactivity in his or her core affect state sets the stage for that reactivity to be maintained through new affective learning throughout the lifespan.

6.2. Core affect as a fundamental feature of conscious experience

Neuroanatomical evidence strongly suggests that core affect provides a source of attention in the human brain (where attention is defined as anything that increases or decreases the firing of a neuron). This implies that core affect has an important role to play in normal perceptual functioning, including consciousness. When sensory information from the world sufficiently influences a person's internal bodily state, the processing of that information is prioritized so that the resulting object is more easily seen (reviewed in Barrett & Bar, in press; Vuilleumier & Driver, 2007) and remembered (reviewed in Kensinger & Schacter, 2008). Put another way, "feeling" and "seeing" (or "hearing" or "smelling" and so on) may not be all that independent of one another.

Core affect has the capacity to influence sensory processing throughout the brain via a number of direct and indirect routes. Parts of the neural reference space for core affect (such as the amygdala and lateral OFC) project directly to all sensory cortices and so can directly influence sensory processing. For example, the basal nucleus of the amygdala projects directly to all portions of the visual ventral stream, serving to modulate neural activity from the association cortex all the way back to the primary visual cortex (or V1) (for a review, see Duncan & Barrett, 2007). The sensory integration network in the central and lateral OFC projects to the visual association areas in the inferior temporal lobe (part of the "what" or ventral visual stream for object recognition) and the visceromotor network in the medial OFC projects to the visual association areas in the inferior parietal lobe (part of the "where" or dorsal visual stream for spatial localization and action preparation) (for a review, see Barrett & Bar, in press). The circuitry that realizes core affect also project indirectly to sensory neurons via three

different routes. The amygdala, the visceromotor network of the OFC (including what is sometimes called the medial OFC or vmPFC), and the ventral striatum project to the ascending arousal systems the brainstem and basal forebrain (for a review, see Edelman & Tononi, 2000; Mesulam, 2000; Semba, 2000) that have diffuse, unidirectional afferent projections throughout the cortical mantle, acting as a “leaky garden hose” (Edelman, 2004, p. 25) to control the level of neuronal firing throughout the brain. (In fact, affective circuitry offers the only path by which sensory information from the outside world reaches the brainstem and basal forebrain; Mesulam, 2000). The amygdala and OFC (as well as the brainstem and forebrain nuclei) also project to certain thalamic nuclei that regulate the transmission of sensory information to the cortex and are partly responsible for forming and selecting the groups of neurons that fire in synchrony (called neuronal assemblies) to form conscious percepts (the things people are aware of seeing) (Zikopoulos & Barbas, 2007; for a review, see Duncan & Barrett, 2007). Finally, the lateral portions of OFC project to lateral prefrontal cortex (which is the source of what scientists term a “top-down” or “goal-directed” or “endogenous” source of attention). In these ways, areas involved with establishing a core affective state can indirectly constrain ongoing processing throughout the rest of the cortex and help to select the information that reaches conscious awareness by directing the formation and maintenance of the neuronal assemblies that underlie conscious experience.

Indeed, evidence shows that sensory areas show enhanced neural activity during perceptual states having a strong core affective component. Affectively potent, as compared to neutral, stimuli generate robust responses in the visual cortex (e.g., Lane et al., 1999; Lang et al., 1998; Moll et al., 2002; Morris et al., 1998; Taylor et al., 2000). Activity in the visual cortex was also enhanced for stimuli that recently acquired affective value by being paired with an electric shock as compared to perceptually similar stimuli that never were paired with shock (e.g., for functional neuroimaging evidence using fMRI see Damaraju et al., manuscript under review Pamalaand & Pessoa, 2008; for ERP evidence see Stolarova et al., 2006).

Our own meta-analytic investigation of fMRI and PET studies of emotion confirmed that V1 is consistently activated in response to affectively potent as compared with neutral stimuli (Kober et al., 2008; Wager et al., 2008; see Fig. 4.2). Activity in the visual cortex also appears to be further enhanced when affective stimuli are particularly arousing. When we assessed activation in the visual cortex in studies of negative core affect (using negative pictures, sounds, words, facial expressions, etc.), there was greater neural activity in studies using stimuli that generated core affective states that were high in arousal as compared to lower in arousal (e.g., perception of fear faces vs. neutral faces; experiences of anxiety vs. neutral affect) (Bliss-Moreau et al., 2008).

The pattern of projections from the neural reference space for core affect to visual cortex suggests the intriguing hypothesis that what people literally see in the world around them may in part be determined by their core affective state. In our lab, we are in the process of investigating three specific hypotheses with respect to core affect and vision.

First, we hypothesize that core affect may play a role in basic object perception, even when objects are not affectively evocative *per se*. As we noted already, the OFC has strong reciprocal projections to both the dorsal “where” and ventral “what” visual streams involved in object perception. Furthermore, when briefly presented objects are successfully recognized, there is more neural activity in OFC as compared to when objects go unrecognized (Bar et al., 2001, 2006). One hypothesis is that OFC provides top-down modulation of basic visual processing necessary for determining both what and where objects are (Barrett & Bar, *in press*). Feeling something affective about sensory stimulation may make it more likely that you will see an object in the first place.

Second, we are investigating the hypothesis that an individual’s momentary core affective state helps to select the contents of consciousness, so that what you feel literally influences what you see. There is evidence, for example, that the affective content of a visual image can resolve a phenomenon called “binocular rivalry.” Binocular rivalry occurs when two incompatible images are presented to both eyes that cannot be merged into a coherent three dimensional image. Instead of perceiving a mixture of the two images, people experience one image at a time, oscillating back and forth into visual awareness every few seconds. By measuring which percept is seen first, and for how long, it is possible to assess which percepts are selected for subjective awareness. A handful of studies have shown that images with affective meaning tend to be represented in conscious awareness more often than rival images with more neutral content. Valenced scenes have greater perceptual dominance over neutral scenes (Alpers & Pauli, 2006), as do facial depictions of emotion when compared to neutral faces (Alpers & Gerdes, 2007). Stimuli that have recently acquired affective value by being paired with an aversive electric shock in an associative learning paradigm also dominate subjective visual awareness compared to neutral stimuli (Alpers et al., 2005). In our lab, we are currently exploring how changing the core affective state of the perceiver more directly influences subjective visual awareness for objects (such as faces). In our lab, we now have preliminary evidence that affectively-potent objects are selected over neutral objects more often when the perceiver is in a salient affective state.

Third, we are investigating whether individual differences in core affect enhance or diminish blindsight. Blindsight occurs when perceptually blind people (i.e., people who report not being able to see) are able to detect visual stimuli without having any conscious or qualitative awareness that

they can do so (Weiskrantz, 1986). Blindsight can be induced in the lab with the brief presentation of an object (e.g., 16 or 33 ms) followed by a backward mask (to prevent the re-entrant feedback processing that is necessary for subjective awareness). Although objects not consciously seen under these conditions, people can still respond to them behaviorally in such a way as to indicate that the objects are being detected at better than chance levels. We hypothesize that a strong core affective state may enhance experimentally-induced blindsight, so that intense core affective feelings may allow people to better detect and act on certain objects or blind them to others, before the sensory information is shaped into a fully formed percept that reaches full subjective awareness.

Although our research on the affect and vision is in its infancy, it will have two important implications if successful. First, this research explores the possibility that there is normal variability in the extent to which the world appears affectively infused, so that the environment may literally look different to different people depending on how they feel. This would translate into different base rates for affective (and potentially emotional) events even when the physical surroundings are held constant. It is highly possible that this variation instantiates individual differences in personality dimensions that are broadly related to mental and physical illness (e.g., neuroticism and introversion). Some people may be affectively wired to see certain types of information better.

Second, and perhaps more importantly, this research will inform an ongoing debate over the distinctiveness between affect and cognition, suggesting that the distinction may not be an ontological distinction that is respected by the brain (cf. Duncan & Barrett, 2007). The most far-reaching implication of this work is that “thinking” (e.g., sensing and categorizing or deliberating on an object) might not be a fundamentally different sort of psychological activity than “affecting” (i.e., constructing a state to represent how the object affects you).

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HUMAN MIMICRY

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Abstract

Human mimicry is ubiquitous, and often occurs without the awareness of the person mimicking or the person being mimicked. First, we briefly describe some of the major types of nonconscious mimicry—verbal, facial, emotional, and behavioral—and review the evidence for their automaticity. Next, we argue for the broad impact of mimicry and summarize the literature documenting its influence on the mimicry dyad and beyond. This review highlights the moderators of mimicry as well, including the social, motivational, and emotional conditions that foster or inhibit automatic mimicry. We interpret these findings in light of current theories of mimicry. First, we evaluate the evidence for and against mimicry as a communication tool. Second, we review neuropsychological research that sheds light on the question of *how* we mimic. What is the cognitive architecture that enables us to do what we perceive others do? We discuss a proposed system, the perception-behavior link, and the neurological evidence (i.e., the mirror system) supporting it. We will then review the debate on whether mimicry is innate and inevitable. We propose that the architecture enabling mimicry is innate, but that the behavioral mimicry response may actually be (partly) a product of learning or associations. Finally, we speculate on what the behavioral data on mimicry may imply for the evolution of mimicry.



1. INTRODUCTION

How many times have you caught a friend, colleague, or acquaintance mimicking someone else? Mimicry is everywhere—we all do it, and do it frequently. Even a casual glance at people interacting at an office, restaurant, bar, park, or at home will reveal many manifestations of our proclivity to mimic others. We fall into a British accent while talking with our friend from London on the phone; we cross our legs when our new boss crosses hers; we wince when we see someone at a doctor's office in pain. We aren't trying to imitate the other person, and we aren't aware of mimicking them. Likewise, the friend, boss, and stranger at the doctor's office don't notice it either. The facility and tendency of humans to mimic each other has long been of interest to philosophers, psychologists, authors of popular press books, and laypeople alike. But what does the research say about mimicry and its ubiquity, impact, function, and underlying cognitive and neural mechanisms?

The answer is, quite a lot. Humans are intensely social animals and research suggests mimicry is a critical part of human social interactions. It is intimately tied to relationships, liking, and empathy, functioning both as a signal of rapport and as a tool to generate rapport. Its use can occur entirely outside of awareness and yet it can also be used consciously and deliberately. It has important consequences both within and beyond the mimicry dyad. Indeed, it appears to be such a critical part of social functioning that the brain may have even evolved specific capabilities to facilitate its use.

Human mimicry has been the focus of research in disciplines ranging from communication, neuroscience, and social, developmental, clinical, and consumer psychology. Although the questions asked, the methodologies, and the level of analysis vary across the disciplines, a consensus is emerging. Automatic, nonconscious mimicry exists in many forms and its strength and frequency are determined by a variety of social, cognitive, affective, and motivational factors. Moreover, mimicry has important consequences, impacting the mimicry dyad as well as the individuals involved.

An important distinction to make is between conscious imitation and nonconscious mimicry. The *conscious* imitation of others is critical to learning and to navigating our social environment (Bandura, 1962). However, the focus of the current paper is on mimicry, which occurs without the mimicker's or mimickee's awareness. The current paper unfolds in the following way. First, we briefly describe some of the major types of nonconscious mimicry—verbal, facial, emotional, and behavioral—and review the evidence for their automaticity. Next, we argue for the broad impact of mimicry and summarize the literature documenting its influence on the mimicry dyad and beyond. This review highlights the moderators of

mimicry as well, including the social, motivational, and emotional conditions that foster or inhibit automatic mimicry. Who is most likely to mimic and who is most likely to be mimicked?

In the face of this critical mass of research into the ubiquity and impact of mimicry, one goal of our review is to contextualize it all into a broad theory of mimicry. Thus, after reviewing the impact of mimicry, we will interpret these findings in light of theories on mimicry. First, we evaluate the evidence for and against mimicry as a communication tool. Is the function of mimicry to signal to others that we understand and empathize with them? Do we mimic because we want to signal this rapport? Second, we review neuropsychological research that sheds light on the question of *how* we mimic. What is the cognitive architecture that enables us to do what we perceive others do? Despite the ubiquity and intuitive appeal of mimicry, it is remarkably difficult to explain how perceiving someone else perform a movement can lead us to automatically reproduce that movement. In fact, it requires a specific cognitive and neural system. We discuss a proposed system, the perception-behavior link, and the neurological evidence (i.e., the mirror system) supporting it.

We will then review the debate on whether mimicry is innate and inevitable. Does the automaticity of mimicry imply that we are born with hardware enabling us to imitate from the minute we are born? Or is mimicry something that needs to be trained and practiced, shaping the way mimicry is eventually manifested? We propose that the architecture enabling mimicry is innate, but that the behavioral mimicry response may actually be (partly) a product of learning or associations. Finally, we speculate on what the behavioral data on mimicry may imply for the evolution of mimicry. We conclude that mimicry is pervasive and has important consequences, and hope that the next time the reader picks up a British accent after talking to a friend in London, he or she will have better insight into how and why this occurred.



2. TYPES OF MIMICRY

Mimicry is manifested in various ways, and often the mimicker neither intends to mimic nor is consciously aware of doing so. What is mimicked? For one, individuals mimic the facial expressions of others. This can lead to emotional contagion, or “catching” the emotions and moods of others. Verbal mimicry occurs when people match the speech characteristics and patterns of their interaction partners. Finally, behavioral mimicry involves taking on the postures, mannerisms, gestures, and motor movements of other people. We briefly review the empirical support for each type of mimicry, including evidence for its automaticity.

2.1. Facial mimicry

One of the most recognizable forms of human mimicry is the tendency to mimic the facial expressions of others. O'Toole and Dubin (1968) found that when infants open their mouths to feed, mothers tend to open their mouths in response. Chartrand and Bargh (1999) examined facial mimicry in laboratory experiments and found that individuals interacting with a smiling confederate smiled more than those interacting with a confederate who did not smile. In a provocative study, Zajonc et al. (1987) found that married couples have more facial similarity over time, and one could argue that this similarity results from the couples frequently mimicking each other's facial expressions.

Does facial mimicry occur automatically? Suggestive evidence comes from the developmental literature showing that neonates (one-month old) stick out their tongues when observing others doing the same (Meltzoff & Moore, 1977). Infants have also been found to mimic the facial expressions of emotion (Termine & Izard, 1988). The work of Dimberg et al. (2000) provides more direct evidence for the automaticity of facial mimicry (see also Dimberg, 1982; Vaughan & Lanzetta, 1980). In their research, three groups of participants were exposed to faces that were happy, sad, or neutral. The faces appeared for 30 ms, followed by a neutral face for 5 s. The subliminal presentation along with the long backward mask (i.e., the neutral face) prevented participants from consciously perceiving the happy or sad faces. During the viewing of the facial stimuli, the spontaneous facial electromyographic activity for participants was recorded. Based on the authors' previous findings that activity in certain facial muscles can be automatically evoked by exposure to angry and happy faces (Dimberg & Thunberg, 1998), the authors specifically focused on the activity of the corrugator supercilii muscle, which knits the eyebrows during frowns, and the zygomatic major muscle, which elevates the lips during smiles. Dimberg et al. (2000) argued that if different emotional responses can be automatically elicited, then subliminal, unconscious exposure to happy or sad faces should differentially activate these particular muscles. Although participants showed no awareness of having consciously seen the happy or sad faces, their facial emotional response patterns showed that the zygomatic major muscle activity was highest when exposed to happy faces, and that corrugator supercilii muscle activity was highest in response to sad faces (see also Lundqvist & Dimberg, 1995). Thus, facial mimicry in this work occurred automatically as a result of being unconsciously (subliminally) exposed to emotional faces (see also Achaibou et al., 2008).

2.2. Emotional mimicry

Given that facial expressions of emotions elicit emotional experiences (Laird & Bresler, 1992; Strack et al., 1988), it is perhaps not surprising that facial mimicry facilitates emotional mimicry—the contagion of emotions displayed

by others (Hatfield et al., 1994, in press). Supporting this, Lundquist and Dimberg (1995) found that the facial mimicry of subliminally presented facial stimuli is accompanied by congruent emotional experiences (see also McIntosh, 2006). Laird et al. (1994) found that mimicry mediates the effects of viewing others' emotions on the observer's own emotional state (but see Gump & Kulik, 1997). Interestingly, the mimicry of facial expressions may be more likely to lead to the corresponding affective state for some emotions than others. Hess and Blairy (2001) found that although facial mimicry occurred for many different emotions, emotional contagion only occurred for happiness and sadness, but not for more specific emotions such as anger and disgust.

Neumann and Strack (2000) found that the audition of affectively laden vocal intonations elicited a congruent mood state in the listener. Specifically, they had participants listen to a cassette of a target person reciting an affectively neutral speech in either a slightly happy or a slightly sad voice. Participants who heard the slightly happy voice reported being in a better mood than those who heard the slightly sad voice. In a follow-up study, participants who repeated back the content of the speech they heard mimicked the affective tone of the speaker's voice. This suggested that participants adopted a mood state that was congruent with the mood implied by the speaker's voice.

Ramanathan and McGill (2008) found further evidence for emotional contagion in an experimental study of mimicry and consumption. Participants watched a movie clip with another person who they could either see or not see. When they could see the other person (but not when they could not see the other person), their own emotional expressions could be predicted by the prior expression of the other person. However, this was only true if the participant had looked at the other person and thus observed the expression. The contagion effect in this study lasted about 2–3 s as measured by the participants' facial expressions.

Perhaps not surprisingly, emotional mimicry is moderated by such basic factors as liking and expressiveness. For instance, people tend to catch the emotions of those they like more than those they don't like (Howard & Gengler, 2001). Interestingly, level of expressiveness also appears to moderate the extent of emotional contagion (Friedman & Riggio, 1981; Sullins, 1991). For instance, Friedman and Riggio (1981) found that participants who were highly expressive transmitted their moods to other participants more easily, especially to those who were less expressive. This occurred even when the group of participants were sitting together silently, precluding any verbal communication. Thus "expressiveness" can be communicated nonverbally, leading to the higher rates of mood transmission among highly expressive individuals. This individual-difference effect of expressiveness is further moderated by the type of mood that is being displayed (Sullins, 1991). Specifically, when the mood being displayed is happy, both high and low-expressive participants pass their mood on to others. But

when the mood is negative, the highly expressive participants transmit their mood to others more than do low-expressive participants.

2.3. Verbal mimicry

Humans engage in verbal mimicry from a very early age. In fact, neonates as young as two to four days old have been found to cry in response to another infant's crying (Simner, 1971). Interestingly, infants do not mimic synthetic cries, which suggest that newborns can actually discriminate between real and artificial cries. Research with adult participants has found that speech patterns also converge over time. Specifically, people adopt each others' accents, speech rate, utterance duration, and latency to speak (Cappella & Planalp, 1981; Giles & Coupland, 1991; Giles & Powesland, 1975; Gregory et al., 1997; Matarazzo & Wiens, 1972; Webb, 1969). Controlled experiments have also found that speakers mimic their conversation partners' syntax (i.e., they structure their sentences the same way) across multiple sentences (Bock, 1986).

Much of this verbal mimicry occurs automatically, without the intention or awareness of the people involved. In research supporting this, Levelt and Kelter (1982) found that people use the same words and clauses that their interaction partners use during conversations (see also Niederhoffer & Pennebaker, 2002). Importantly, they had a condition in which participants' cognitive resources were taxed, and found that mimicry occurred even when participants were under cognitive load. This suggests that imitation of the words and clauses used by interaction partners occurs automatically and nonconsciously.

2.4. Behavioral mimicry

Behavioral mimicry refers to the adoption of the mannerisms, posture, gestures, and motor movements of one's interaction partner. Some of the first research into behavioral mimicry was conducted by Schefflen (1964). He believed that the postures and body positioning occurring between psychotherapists and their clients could provide insights into the dynamics between them. To test this possibility, he videotaped 18 therapists conducting psychotherapy sessions in order to analyze the behavioral patterns being used to communicate during these sessions. He argued that "postural congruence"—mimicry—indicated similarity in the views or roles held by the therapists and their clients.

Bernieri and colleagues (Bernieri, 1988; Bernieri et al., 1988) have tested behavioral mimicry in controlled laboratory settings. In one study, they examined whether naïve judges rated "real" interactions as more synchronous than interactions that never actually took place. Several mother-child

interactions were videotaped, always with the child on the left of the screen and the mother on the right part of the screen. The researchers then created different versions of the videotapes, some in which mothers were paired with their own children and some in which mothers were paired with other children. Upon watching these videos, participants rated how physically in sync the pairs were. Mothers were judged to be more in sync with their own children than they were with other children.

Bavelas and colleagues examined the behavioral mimicry that occurs when an observer and target face each other (Bavelas et al., 1988). The question they addressed was whether the observer's motions mirror the direction of a target (mirror mimicry) or whether the observer's motion is the same as the target if the observer was rotated into the target's position (rotational mimicry). The target leaned to the right or the left, and the researchers found in several studies that participants displayed mirror mimicry, not rotational mimicry (see also LaFrance & Broadbent, 1976).

In a series of studies focusing on the mimicry of mannerisms, Chartrand and Bargh (1999) found that mimicry occurs automatically in dyadic interactions. Participants engaged in a photo description task with a confederate (ostensibly another participant) they did not know. The confederate either moved her foot or touched her face throughout the session. Then the participant did the same task with a second confederate, who engaged in the mannerism that the first confederate did not. Hidden videocameras that were focused on the participants were used to record these sessions, and coders blind to the experimental condition and hypotheses later watched these recordings and rated the amount of face touching and foot moving that the participant engaged in. Results provided evidence for what the authors coined "the chameleon effect": participants changed their own mannerisms to blend in with those in their current environment. That is, they moved their foot more when with the foot-mover than the face-toucher, and they touched their face more when with the face-toucher than the foot-mover. Participants reported no awareness of either the confederates' mannerisms or their own mimicry of those mannerisms, providing additional evidence that behavioral mimicry can be an automatic and nonconscious process.

Thus, there is substantial evidence for facial, emotional, verbal, and behavioral mimicry. We mimic virtually everything that we can observe another person do, and even "catch" their affective states as well. Importantly, these types of mimicry can all occur outside of conscious awareness and intent. Studies documenting the existence of mimicry in various domains were an important first step in understanding the breadth of the phenomenon. We now know that mimicry is pervasive in virtually all social interactions. Are there any consequences of this mimicry? Given its ubiquity, it is important to uncover any downstream effects of the presence or absence of mimicry. It is to these consequences that we now turn.

3. THE IMPACT OF MIMICRY

The previous section reviewed the types of mimicry and the evidence for their automaticity. The fact that we mimic others so much may make for fascinating cocktail conversation, but is it any more than that? Recent research suggests that, in fact, mimicry affects us in important ways. Figure 1.1 presents an overview of the model. Perhaps not surprisingly, the presence of mimicry has an effect on the dyad (i.e., the mimicker and the mimickee), leading to more rapport, empathy, and liking between them. It “binds and bonds” people together, serving as a social glue (Chartrand et al., 2005; Lakin et al., 2003). But mimicry does much more. For one, it affects people’s general social orientation (beyond the other person in the mimicry dyad) such that they feel closer to others and are more likely to help them (van Baaren et al., 2004a). Perhaps most surprisingly, mimicry has effects on the individuals who are mimicked—consequences that one might not guess to arise from a nonverbal behavior displayed during a social interaction. For instance, being mimicked can make a person procrastinate more, increase a person’s self-esteem, reduce a person’s willpower to resist eating junk food, make a person like a snack they normally wouldn’t, make a woman do worse at a math task, and lead to more creativity. In this section, we review the evidence for the impact of mimicry on the dyad and the individuals involved.

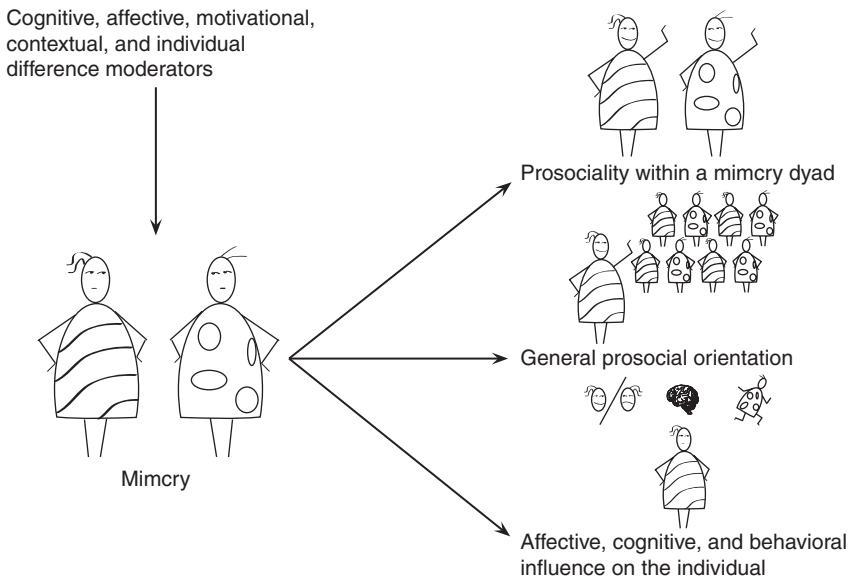


Figure 1.1 The moderators and consequences of human mimicry.

3.1. Impact on the mimicry dyad: Bringing and keeping people together

We first discuss the impact that mimicry has on the person mimicking and the person being mimicked. The members of the “mimicry dyad” are influenced in various ways by the presence or absence of mimicry during an interaction. In short, mimicry encourages affiliation between interaction partners and gives rise to a prosocial orientation. We review this evidence and make the following conclusions: (1) there is a link between mimicry on the one hand and liking and rapport on the other. Mimicry leads to rapport and vice versa; (2) when individuals want to affiliate with others they nonconsciously engage in more mimicry of them, and when they want to disaffiliate they automatically engage in less mimicry, suggesting that mimicry is used as an unconscious tool to create rapport; (3) mimicry can lead to empathy, which facilitates understanding the emotions felt and displayed by others; (4) mimicry leads to a merging of the minds—to more similar attitudes and shared viewpoints; (5) mimicry leads to more prosocial (i.e., helping) behavior toward the mimicker; (6) individuals are more persuaded by people who mimic them than by people who do not.



4. THE LINK BETWEEN MIMICRY, LIKING, AND RAPPORT

The earliest research on the impact of mimicry focused on the relationship between “behavior matching” or “posture sharing” and liking, rapport, and empathy. Interest began over 40 years ago regarding the correlation between mimicry and rapport, and experimental evidence has accrued more recently for causality in both directions.

4.1. Correlational evidence

In the fields of clinical and counseling psychology, researchers have long been interested in the nonverbal communication transpiring between the therapist and client. As discussed previously, some early research on mimicry was conducted in such settings, testing the impact of mimicry on the therapy relationship (Charney, 1966; Dabbs, 1969; Schefflen, 1964). In one notable study, Charney (1966) observed psychotherapy sessions and found that the postures of therapist and client converged over time such that the postures were more similar at the end of a session than they were at the beginning (see Johnston et al., 2008, for similar findings on the time course

of mimicry). Importantly, this convergence in posture was significantly correlated with an increase in rapport between the therapist and client (see also Maurer & Tindall, 1983). This was some of the earliest evidence that mimicry was related to rapport.

Other early research went beyond the psychotherapy setting to study the relationship between mimicry and rapport. LaFrance and Broadbent (1976) postulated that nonverbal behavioral mimicry would be a good index of group rapport. In a study testing this, they analyzed the similarity between the body and arm positions of teachers and their students in college seminar classrooms and found that students reported greater rapport in classrooms where such mimicry was more frequent. Tickle-Degnen and Rosenthal (1990) conducted a meta-analysis on rapport and found that three distinct facets—mutual attention, positivity, and coordination—are correlated with specific nonverbal behaviors. The coordination element in particular was strongly linked to mimicry.

Is the correlation between rapport and mimicry observable by outsiders? An interesting experiment by Grahe and Bernieri (1999) suggests the answer is yes. The researchers conducted an experiment in which they asked participants to judge rapport in dyadic interactions, based on different types of information. Participants were given access to the details of the dyadic interactions based on (1) a transcript of the interaction, (2) audio playback of the interaction, (3) video playback, (4) video playback with a transcript, or (5) video and audio playback. Counterintuitively, the researchers found that participants who were only given the video playback only—which provided only nonverbal behavioral information—were in fact the most accurate in judging the amount of rapport in the interaction. In contrast, those given verbal information (either the transcript of the interaction or the audio playback) were less accurate in judging the rapport, which speaks to the importance of nonverbal cues, including mimicry or “synchronized” behaviors, for this type of judgment.

Thus, shared motor movements and rapport are positively correlated, and this is felt among the people in the interaction as well as noticed by outsiders. But how do postures or mannerisms come to be shared? If there is convergence in these bodily movements, it must be due to mimicry, either on the part of one interaction partner or both partners. The mimicry may or may not be consciously engaged in, but one or both of the interactants is taking on the posture, mannerisms, and movements of the other(s). Given the link between mimicry and rapport, what is the causal direction? There are two possibilities. One is that existing rapport between interactants leads to more mimicry. That is, people who like each other mimic each other more, often without realizing it. Perhaps the less intuitive possibility is that mimicry (both mimicking others and being mimicked by others) leads to more rapport. There is now evidence for both causal directions.

4.2. Being mimicked leads to liking and rapport

In a study testing the latter causal direction, Chartrand and Bargh (1999) had participants engage with another “participant” (actually a confederate) on a photo description task. Importantly, the participant and confederate were strangers in this study, so there was no preexisting rapport between them. The confederate either subtly mimicked the posture and mannerisms of the participant throughout the interaction or did not. The participants were then asked how smoothly the interaction with the “other participant” went, and how much they liked the person. Results indicated that they had smoother interactions and liked the other person more when that other person mimicked them than when they did not. No participant reported noticing being mimicked (or not) or sharing postures and mannerisms (or lack thereof). Maurer and Tindall (1983) found that adolescents who were mimicked by a school counselor thought that counselor was more empathic than did those who were not mimicked by the counselor. Interestingly, Hove and Risen (2008) have recently found similar effects for interpersonal synchrony. Specifically, they found that when one person synchronizes his or her movements in time with another, that other person feels more affiliation with the synchronizer.

Thus, mimicry (and synchrony) leads to more liking and rapport, even between strangers who presumably don’t want to become friends. This has clear implications for one’s interactions in casual social settings, but can it also impact important interactions that affect one’s career? In a fascinating field experiment conducted at the headquarters of a Fortune 500 company, Sanchez-Burks et al. (in press) had Anglo and Latino managers interact with a confederate in a business interview (in which the participants were the interviewees). The confederate (interviewer) either did or did not mimic the mannerisms, gestures, and posture of the participants during the interview. The researchers were interested in the interview performance of the participants as a function of their ethnicity and whether they were mimicked or not. To assess interview performance, they measured question–answer response latency—the time passed between the end of an interviewer question and the start of an interviewee’s vocal response. They also had human resource experts code the interviewee’s performance along seven dimensions (body language, impact, verbal communication skills, motivation, assertiveness, interpersonal skills, and overall impression). Participants were also asked to provide an overall evaluation of their own performance during the interview. As expected, mimicry affected the participants’ experiences during the interview and their actual interview performance. Participants who were mimicked by the confederate interviewer thought they interviewed better, and they in fact did along the objective measures collected. Interestingly, these effects were moderated by cultural group membership, such that the effect of mimicry on interview

performance was stronger for Latinos than for Anglos. The researchers argued that Latinos have higher levels of relational attunement, and as a result, are more sensitive to the presence of nonverbal cues such as mimicry.

4.2.1. Boundary conditions

Likowski et al. (2008) examined the boundary conditions of the positive consequences of being mimicked. Specifically, they found that being mimicked by a member of an outgroup makes an individual like the outgroup member *less*, not more. Thus, outgroup members who mimic are *less* liked than outgroup members who do not mimic. In a second study, they examined walking synchrony. A synchronized ingroup member was liked more than a nonsynchronized ingroup member, but the opposite was found for outgroup members (a synchronized outgroup member was liked less than a nonsynchronized outgroup member). Interestingly, the authors also found that the effect extends to liking of the ingroup or outgroup as a whole; being mimicked by an ingroup member leads to more liking of the ingroup, whereas being mimicked by an outgroup member leads to less liking of the outgroup.

4.3. Mimicking others leads to liking and rapport

Stel et al. (2008) found it is not just the recipient of the mimicry who benefits from it—so too does the mimicker. The researchers were interested in the relationship between mimicking others and (1) affective empathy toward them (operationalized as emotional contagion, or catching the emotions of others), (2) cognitive empathy toward them (defined as taking the perspective of others and understanding them), and (3) bonding with them (feeling greater similarity to and liking of others). Participants were either instructed to mimic or not mimic the facial expressions of a target, or they were given no instructions either way. Greater mimicry of the target was associated with more affective and cognitive empathy for and more bonding with the confederate. However, this effect was driven by the no mimicry instructions. That is, those who were told to *not* mimic the target (thereby disrupting the automatic, natural mimicry that normally occurs) had less empathy toward the target and felt less bonded with them, compared both to participants who were told to mimic and to participants who were given no instructions. Another study found that both affective and cognitive empathy mediated the effect of mimicking on greater bonding, and that increased bonding led to an increase in subsequent mimicry.

Thus, mimickers become more empathic toward the person they are mimicking. Are these prosocial feelings communicated somehow (nonverbally) toward the mimickee? In a study by Stel et al. (2008), participants were mimicked or not during a mock interview. Participants who were mimicked felt more empathized with and understood than participants who

were not mimicked. Interestingly, the mimicked participants in turn became more empathic to the mimicker. These results suggest that mimicry serves an important social function by communicating empathy and understanding to the mimickee. Indeed, when mimicry is not present, interaction partners feel not only less understood, but less emotionally attuned to one another as well (Stel et al., 2008).

4.3.1. Boundary conditions

Thus, there is evidence that mimicking others leads to more liking for the mimickee. However, there are boundary conditions to this effect. Stel et al. (2008) found that if a person is already disliked, then intentionally mimicking that person does not lessen the disliking. Participants were instructed to either mimic or not mimic another person who was either likable or not likable. When participants intentionally mimicked a likable person, then liking for that person was improved. But when they mimicked an unlikable person, the intentional mimicry did not improve liking for that person. Whether this holds during natural (unmanipulated) mimicry remains to be seen.

4.4. Rapport and liking lead to more mimicry

Thus, mimicry leads to liking and rapport. But what about the reverse causal direction: does rapport and liking lead to more mimicry? McIntosh (2006) looked at preexisting and manipulated liking and found that for both, liking led to more mimicry. Likowski et al. (2008) found that individuals engaged in facial mimicry of happy and sad faces of people they were manipulated to like (via written reports), but they found less mimicry and even incongruent facial muscular reactions to happy and sad faces of people they were manipulated to not like. Stel et al. (2008) have also explored the relationship between mimicry and liking. In a first study where participants' *a priori* liking for a target was manipulated and their mimicry of that person was then measured, they found that when a target is disliked, facial mimicry is attenuated. In another study, mimicry towards targets who were or were not members of a negatively stereotyped group was measured. Participants saw a video with a Moroccan and a Dutch person talking, one after another. They found that the more negative the participant's implicit attitude was toward Moroccans (on a Moroccan/Dutch IAT), the less the Moroccan was mimicked compared to the Dutch confederate. However, explicit attitudes toward Moroccans did not predict mimicry toward the Moroccan confederate compared to the Dutch. Thus, in the presence of a reason to dislike a target, automatic mimicry is reduced.



5. MIMICRY AS A NONCONSCIOUS TOOL TO AFFILIATE AND DISAFFILIATE

What if there is no *a priori* liking or disliking of an interaction partner, but there is a goal to affiliate with that person? Given the link between mimicry and rapport, it might be predicted that with no existing rapport, there should be less mimicry. On the other hand, it would be adaptive if individuals were to mimic more when they want to create rapport with another person, because the research shows that it would be an effective strategy. Given that mimicry usually occurs outside conscious awareness, this would imply that people would be “using” mimicry nonconsciously to create rapport when desired. It would be a weapon in people’s nonconscious arsenals, a tool in their repertoire used to get others to like them. And given that mimicry leads to liking and rapport, it would mean that mimicry is functional and adaptive in creating bonds between people. We next survey the evidence supporting the notion that an affiliation goal increases nonconscious mimicry.

5.1. Increases with goal to affiliate

5.1.1. Direct goal to affiliate

Lakin and Chartrand (2003) found that participants with an affiliation goal mimicked more. This held regardless of whether the goal was consciously held after getting explicit instructions to get along with another person, or nonconsciously held after being subliminally primed with affiliation-related words such as *affiliate*, *friend*, *team*, *partner*, and *like*. Notably, the person the participants mimicked was not physically present in the room with them, but rather was on a videotape. The participants believed the person they were watching, who they would be interacting with on a later task, was seated in a room next door, but it was actually a recorded segment shown via a VCR in a control room. Thus, even when there was no possibility of “communicating” anything to the person they hoped to get along with later, and she couldn’t receive the mimicry “signal” and respond in kind, they still mimicked her. This speaks to the automatic and nonconscious nature of mimicry. Participants also reported no awareness of mimicking the woman on the videotape.

In another study, Lakin and Chartrand (2003) tested whether the affiliation-driven increase in mimicry actually works to build rapport and liking. Participants either had a nonconscious affiliation goal (activated through a subliminal priming procedure) or not prior to completing an on-line task that simulated a chat-room with another person, who was presumably in an

adjoining room. Participants were told to ask the other person a series of scripted questions about university life, and the other person responded to these questions. The responses were actually programmed and there was no other participant. The responses were written to be either short and cold in nature, or longer, warmer, and friendlier in tone. This set the participant up to either succeed at the goal to affiliate or to fail at it. Next, another “participant” entered the room (actually a confederate), and the participants were told this was a new person (not the one in the chat room). They asked the confederate similar questions about student life and the extent to which they mimicked the confederate’s mannerisms during the interaction was assessed.

Participants who had failed earlier at the goal to affiliate with the cold, unfriendly on-line confederate (and who therefore still had an unmet affiliation goal) mimicked the confederate more than those who had succeeded at their earlier goal to affiliate (i.e., who had their goal satiated by the friendly, warm on-line partner). Importantly, the confederates (blind to condition and hypotheses) who interacted with the participants who had failed at the earlier nonconscious goal reported liking the participants more and thinking the interaction went more smoothly, compared to those who interacted with the participants who no longer had an active goal to affiliate.

The Lakin and Chartrand (2003) studies suggest that mimicry is a nonconscious strategy that people use to affiliate with others. It is a part of our behavioral repertoire that we invoke when needed to get others to like us. Moreover, the strategy of mimicry, albeit unconscious, works. People do like us more when we (nonconsciously) mimic them. In conjunction with the Chartrand and Bargh (1999) study, this suggests that mimicry serves an important function—it creates smoother, more harmonious interactions and leads people to like each other more. This speaks to the adaptive, functional nature of nonconscious mimicry: it is in service of the individual, and helps to build relationships.

Of course, people are not often subliminally primed with an affiliation goal in their daily lives. Nor are they always told explicitly to get along with another person. More frequently, it is features of the social environment that activate an affiliation goal in people. The presence of these features or affiliative cues should then lead individuals to mimic more. What are such naturalistic triggers of affiliation motivation, and do individuals mimic more in these situations? It is to this evidence that we now turn.

5.1.2. Feeling different from others

One social cue that triggers a goal to affiliate is feeling too different from other people. Brewer’s (1991) optimal distinctiveness theory suggests that people try to strike a balance between a desire for distinctiveness (i.e., feeling unique and different from others) and a desire for assimilation or belonging (i.e., feeling similar to others). When people feel too distinct or

too similar, they are motivated to regain the balance. Thus, they have a need to assimilate activated in situations where they feel unusual or different. In a study applying the principles of this theory to mimicry behavior, Uldall et al. (2008) had participants complete a supposed "personality test." They were given (bogus) feedback on the test that indicated they had a "personality type" that was either very similar to most others at their undergrad institution or one that was extremely unusual at their university. Participants then interacted with another student (actually a confederate), and those who had earlier been told they were very different from others at their school engaged in more mimicry of the confederate than those who had been told they were similar to others at their school. This suggests that people mimic more when they are feeling too different from in-group members. Mimicry is a way that people (nonconsciously) regain their "optimal" balance (Brewer, 1991) by affiliating with others in an effort to belong.

5.1.3. Social exclusion

The Uldall et al. study shows the importance of the need to belong in triggering mimicry behavior. In fact, some have argued that the need to belong is one of the most important, universally shared aspects of the human race (Baumeister & Leary, 1995; Leary & Baumeister, 2000). Research on social exclusion and rejection suggests that being ostracized or rejected is devastating (Leary, 2001). Given that ostracism can have powerful social, psychological, and behavioral consequences (including aggression and violence toward others), Lakin et al. (2008) set out to see if mimicry was an efficient, low-risk way to regain one's status within an ingroup upon being rejected by them. That is, they tested whether social exclusion increases mimicry, and if so, of whom? Participants engaged in "Cyberball," an on-line ball-tossing game (Williams et al., 2000) in which they tossed the ball back and forth with three other on-line participants. In reality the ball tossing of the three others was controlled by the computers and was programmed to either exclude the participant from the tossing after several turns, or to include the participant. Following Cyberball, the participants were told they would engage in a photo description task with a new participant (actually a confederate) unrelated to the game. Results indicated that participants who had been excluded unwittingly mimicked the confederate more than participants who had been included, suggesting that mimicry is a nonconscious way of affiliating after a rejection experience (for a conceptual replication with children, see Over, in preparation).

Do people immediately mimic the first person they can after a rejection experience, or are they more selective about who they mimic? It would be more adaptive if individuals mimicked a person that would help them regain their status within the group that excluded them, particularly if that group is an important ingroup. However, the mimicry that occurs in these situations is an automatic, unconscious process, and as such, some would argue that it

should be a simple, automatic response—turned on or off—that doesn't vary as a function of the nuances of a particular situation, including the type of person who excluded the person. However, Lakin et al. (2008) argued that unconscious processes can be “smart” and functional, and as such, nonconscious mimicry may help individuals to affiliate specifically with the appropriate (excluding) group.

Female participants were either excluded in the Cyberball game by fellow ingroup members (females) or by outgroup members (males). They then interacted with a “new” participant (confederate) who was either male or female. Participants who were excluded by an ingroup mimicked more, but only when the confederate was an ingroup member. That is, the participants who were excluded by female Cyberball teammates (ingroup exclusion) mimicked the female confederate (ingroup mimicry) more than the male confederate (outgroup mimicry), and more than participants mimicked after being excluded by male Cyberball teammates (outgroup exclusion). Importantly, this increase in mimicry was successful: the interaction partner for the photo description task reported that interactions with excluded participants were smoother than those with included participants. This research provides further evidence that mimicry is a weapon in people's arsenals used to affiliate with others, even though they are unaware they have or use it. Moreover, unconscious mimicry is not an on/off switch that is automatically turned on after exclusion and used indiscriminantly; rather, it is selective and functional in helping people to restore status within important ingroups.

5.1.4. Self-monitoring moderates response to affiliative cues

High self-monitors have been called “social chameleons” because of their tendency to modulate their behavior as a function of their current social environment. Does this modulation of behavior include more mimicry upon being exposed to “affiliation cues” in the environment? Across two studies, Cheng and Chartrand (2003) found that social contexts that included affiliative cues triggered more unconscious mimicry among high self-monitors, but low self-monitors engaged in relatively less mimicry regardless of the social context. In one study, they had participants interact with a confederate whom they believed to be either a peer (fellow undergrad) or nonpeer (high school student or graduate student). High self-monitors interacting with a “peer” mimicked more than those interacting with a “nonpeer,” and more than low self-monitors interacting with either a peer or nonpeer. In a second study, the researchers found that compared to low self-monitors, high self-monitors responded more to social cues indicating that another person is more powerful than they by engaging in more mimicry. Participants were randomly assigned to be a “worker” or “leader” in a task with a confederate (who was assigned the opposite role). High self-monitors assigned the worker role mimicked the confederate (the leader)

more than those assigned the leader role, and more than low self-monitors assigned either role. Thus, high self-monitors engaged in more mimicry than low self-monitors, supporting their nickname of “social chameleons” (see also Estow et al., 2007). More importantly, compared to low self-monitors, high self-monitors pick up more on the affiliative cues in the environment and respond by increasing their nonconscious mimicry.

5.2. Decreases when people don’t want to affiliate

Thus, there is substantial evidence that nonconscious mimicry increases when a member of a dyad has a goal to affiliate. The goal to affiliate can be triggered by various environmental features, but regardless of how it is activated, it leads to the same increase in mimicry. What if a dyad member does not want to affiliate or even wants to disaffiliate with someone? When one is interacting with a member of an outgroup, or someone with a stigma, or someone dislikeable, does that person still engage in mimicry, or is it automatically reduced? Evidence suggests the latter, and it is to this research that we now turn.

5.2.1. Stigmatized others

Johnston (2002) provided the first evidence that people mimic less when they do not want to affiliate with someone. Participants observed the ice cream eating behavior of confederates who either had a social stigma (e.g., obesity, a facial scar) or not. Participants mimicked the ice cream consumption of the confederate, unless the confederate was stigmatized. If the confederate had a stigma, participants presumably did not want to affiliate with or be like her, and as a result they mimicked her less.

5.2.2. Outgroup membership

Another condition in which people don’t want to affiliate is when interacting with outgroup members. Yabar et al. (2006) investigated the influence of group membership on nonconscious behavioral mimicry. The authors argued that if mimicry is associated with the establishment of social harmony and acts as a “social glue” that binds and bonds people together (Lakin et al., 2003), then greater mimicry should occur of ingroup members than outgroup members. Non-Christian female participants viewed videotapes of two female targets describing photos to them. One of the targets wore a large crucifix and a fluorescent wrist bracelet with the words “Got God” on it, identifying her as an outgroup member (i.e., a Christian). Both targets touched and rubbed their face during the photo description, and a hidden videocamera recorded the extent to which participants touched their own face. Results revealed that there was greater mimicry of the face touching behavior of the ingroup member (non-Christian) than the outgroup member (Christian). These results are consistent with participants

not having a goal to affiliate (or having a goal to *not* affiliate) with a member of an outgroup. Heider and Skowronski (2008) have found a similar finding with ethnic groups. African-American and Caucasian participants interacted with two confederates one after the other, one African-American and one Caucasian. They found more mimicry of ethnic ingroup members than ethnic outgroup members. Similarly, Bourgeois and Hess (2008) found more facial mimicry of ingroup members than outgroup members. Interestingly, they found that expressions of happiness were always mimicked, but negative emotions were only mimicked when shown by an ingroup member.

In a second study, Yabar et al. (2006) found an association between the strength of liking for a target group and mimicry of a member of that target group. Implicit liking for the target group (again Christians) was assessed using an Implicit Association Test (IAT; Greenwald et al., 1998), and explicit liking for the target group was assessed with an affective thermometer scale (Kinder et al., 1982). The authors found that the extent to which a person likes Christians in general predicted the extent to which the participant mimicked the Christian confederate. The degree of mimicry of the Christian confederate could be predicted from both the explicit and implicit liking measures of the outgroup. Interestingly (and unexpectedly), the authors also found that the effect of implicit liking on mimicry was in the opposite direction as the effect of explicit liking on mimicry. Specifically, explicit liking of the target group predicted less mimicry, whereas greater implicit liking predicted more mimicry. This suggests that noting any discrepancy between explicit and implicit liking for an outgroup and understanding the nature of that discrepancy is important in predicting a person's mimicry of members of that outgroup.

5.2.3. Relationship shielding

Another situation in which one may want to avoid affiliating with another person is in the context of romantic relationships. Karremans and Verwijmeren (2008) tested whether people who are involved in a romantic relationship nonconsciously mimic an attractive opposite-sex other to a lesser extent than people not involved in a relationship. They based this hypothesis on the emerging evidence that nonconscious mimicry can vary as a function of one's current goals. In a provocative study, the authors had participants who were and who were not involved in a romantic relationship interact with an attractive opposite-sex other. The amount of mimicry displayed by the participants during the interaction was observed. Results revealed that participants who were in a relationship mimicked the attractive opposite-sex other less than those not involved. The researchers argued that mimicry may serve a subtle relationship shielding function. Supporting this, they found that involved participants mimicked the attractive alternative less to the extent that they were more close to their current partner and more satisfied with their current relationship. The authors also found that the effect of relationship

status on level of mimicry displayed toward an opposite-sex other is mediated by perceived attractiveness of the opposite-sex other. Thus, being in a romantic relationship (especially a good one) leads to thinking an attractive opposite-sex other is less attractive, in turn leading to less mimicry.

6. MIMICRY, EMPATHY, AND UNDERSTANDING OTHERS

Thus, mimicry brings people together by fostering liking and making attitudes more similar. Stel and van Knippenberg (2008) found that mimicry plays yet another important function within the dyad: understanding the emotions felt and displayed by our interaction partners. How do we understand the emotions of others? The researchers argue that in addition to the traditional, relatively long categorization process, there may be a shorter mimicry-based empathic process. They draw on embodied cognition theory (Barsalou et al., 2003; Niedenthal, 2007), which suggests that mimicry contributes to the recognition of affect experienced by others. Specifically, by mimicking another's emotional expression, one experiences the corresponding emotions him- or herself (i.e., experiences empathy), which in turn facilitates instantaneous emotion recognition. Participants in a series of studies were asked to indicate quickly and accurately whether briefly displayed facial emotions were positive or negative. The emotions were shown on a computer screen for a short (but not subliminal) amount of time—67 ms. While doing this task, half of the participants had facial constraints that prevented them from engaging in natural mimicry. Results revealed that when participants were constrained and could not mimic, the speed of their recognition of affective valence was slowed down for female participants, but not male participants (but see Blairy et al., 1999). The authors argue that this is because women are more facially expressive than men, and due to this enhanced expressiveness, facial feedback is more important in emotion-related processing for women than for men. Thus, constraining the natural facial mimicry of women impairs speed of emotion recognition more so than for men. The study suggests that mimicry plays an important role in understanding the emotions of others, (see Knoblich & Sebanz, 2006) an argument to which we will return later.

Given the relationship between empathy and understanding others, it is perhaps not surprising that individual differences in empathy modulate the amount of mimicry that occurs in an interaction. Chartrand and Bargh (1999) found that those high in the likelihood to take the perspective of others (argued to be a cognitive form of empathy, Davis, 1984) mimic more than those not as likely to take the perspective of others. In a study by Sonnby-Borgstrom et al. (2003; see also Sonnby-Borgstrom, 2008), participants high in emotional empathy mimicked the facial expressions of others

at short exposure times, demonstrating an automatic component in the process of emotional empathy.



7. MIMICRY AND SIMILARITY

That mimicry is related to liking, empathy, and rapport suggests that it serves to bring people together emotionally. Does it also bring people together psychologically? One indicator of this would be if people become more similar in attitudes and opinions when they are mimicked. Perhaps mimicry is related to similarity more generally, with bidirectional causality. It is to this evidence that we now turn.

7.1. Attitudes converge

Ramanathan and McGill (2008) examined whether mimicry and emotional contagion can lead people's evaluations of an experience to converge with the evaluations of those with whom they are sharing the experience. They found that joint consumption and the mimicry that happened during this consumption led to coherence in moment-to-moment evaluations. In one study, participants watched a videoclip on a computer monitor in one of three ways: either alone in the room, seated next to a person they could not see (mere presence), or seated next to a person they could see (full presence). The participants provided continuous ratings with a joystick of their enjoyment of the video program. The researchers found that the evaluations of the movie clip converged more in the full presence condition than in either the mere presence or control (alone) condition. Thus, the moment-to-moment judgments of the program differed for those who could observe (and therefore mimic) the expressions of another person compared to those who could not. A second study found direct evidence for facial mimicry and emotional contagion as drivers of this evaluative convergence.

7.2. Mimicry of similar others

Van Swol and Drury (2008b) have also explored the other causal direction of the mimicry-attitude link. Do people mimic others more if those others have similar opinions to their own? They hypothesized yes, echoing earlier theorizing by Schefflen (1964) and LaFrance (1982), who posited that mimicry might be a consequence of shared viewpoints. Specifically, Van Swol and Drury (2008b) tested whether shared opinions moderates the tendency to mimic. Participants read about two vacation destinations and chose which one they preferred. Next, they discussed their choice with two confederates posing as fellow participants. One of these confederates agreed with the participants' choice on vacation destination, and the other

disagreed with the choice. Results indicated that the participants engaged in more mimicry of the confederate who expressed agreement with them, relative to the confederate who expressed disagreement.

7.3. Mimicry of stereotyping others

What if similarities and shared beliefs are made more salient—does that too lead to more mimicry? One interesting implication is that people might mimic others more if their similarity with them is made salient. One form of similarity is shared knowledge, including stereotypes. It has been argued that stereotypes enable interactants to achieve and maintain common ground (Clark & Kashima, 2007). Given the link between mimicry and similarity, perhaps we mimic another person more if that person indicates shared knowledge, including stereotypes. Castelli et al. (2008) tested this notion and found that participants mimic others who are stereotyping more than others who aren't stereotyping. Participants interacted with a confederate who either provided a stereotype-consistent description about the elderly or a stereotype-inconsistent description. Results revealed that nonconscious mimicry was more likely when the confederate used stereotypic information than stereotype-inconsistent information.



8. PROSOCIALITY TOWARD MIMICKER

The fact that being mimicked engenders liking and smoother interactions led researchers to hypothesize that mimicry may also engender other prosocial emotions and prosocial behavior toward the mimicker. Trust is a type of prosocial emotion and Maddux et al. (2008) hypothesized that in light of the relationship between mimicry and prosociality, mimicry should lead to more trust as well. They studied the power of mimicry in a negotiation context. Specifically, they were interested in the effects that mimicry might have on negotiation agreements at the bargaining table. Participants were MBA students at a top business school who were enrolled in a negotiations class. Participants were paired with one other student “opponent,” and in half of the cases, one student was unobtrusively told to subtly mimic the behaviors of the opponent. The task of the pair was to carry out a job employment negotiation. The dependent variables were the individual gain from the negotiation (i.e., the extent to which individually preferred options were selected) and the joint gain from the negotiation (i.e., the extent to which mutually preferred options were selected). Results indicated that mimicry had no effect on individual gains, but did impact joint gains. Specifically, when mimicry occurred during a negotiation, there was a higher joint gain compared to interactions in which no student was told

to mimic the other. In addition, the more participants mimicked their opponents, the higher the resulting joint gain.

A second study by Maddux et al. (2008) replicated the first study, but with a task that made it particularly difficult to come to a mutually preferred agreement. MBA students interacted in dyads in which either one person had been instructed to mimic the opponent, or neither had been instructed to mimic. In this study too, mimicry increased the likelihood that a dyad would come to an agreement, and the more the participants actually mimicked the opponents, the more likely they were to come to an agreement. In addition, this study found that the effect of mimicry on the agreement reached was mediated by overall dyad trust. That is, mimicry engendered greater trust between the interactants, which in turn facilitated deal making.

Thus, mimicry leads to not only liking and smoother interactions, but to more prosocial emotions toward the mimicker. But what about prosocial behavior? van Baaren et al. (2003a) conducted a study looking at tips given to waitresses in a restaurant. Waitresses were instructed to either recite back verbatim a customer's order, or to paraphrase that order (indicating an understanding of the order without verbal mimicry). Tips given to the waitresses were used as the measure of prosociality. Results indicated that the waitresses received more substantial tips from customers whom they mimicked than from customers whom they did not mimic. Mimicry led to more prosocial behavior.

In a study examining helping behavior, participants were either mimicked or not by an experimenter (van Baaren et al., 2004a). The experimenter then "accidentally" dropped a bunch of pens, and the amount of pens picked up was the unobtrusive measure of helping behavior. Participants who were mimicked picked up more pens for the experimenter than those who were not mimicked. Thus, individuals are more willing to help someone after being mimicked by that person than after not being mimicked. This effect was recently replicated with very young children (Carpenter et al., 2008). Eighteen-month olds were mimicked or not by an experimenter and subsequently observed the experimenter "accidentally" drop pens on the floor. The results revealed that mimicked children helped the experimenter pick up more pens than nonmimicked children.



9. PERSUASION

That mimicry has prosocial consequences has been of interest to researchers interested in persuasion. As reviewed earlier, mimicry leads to a convergence in attitudes and opinions. Moreover, previous research has found that individuals are more persuaded by others whom they like, trust, and to whom they feel similar (Cialdini, 2001). Because mimicry fosters

these feelings (Bavelas et al., 1986; Chartrand & Bargh, 1999; Maddux et al., 2008), it may lead to more success during explicit persuasion attempts, a hypothesis that has been tested recently.

9.1. Evidence against mimicry impacting persuasion

In work by Van Swol (2003), mimicry increased the perception of persuasiveness, but did not increase actual persuasion. Participants were asked to play the role of a manager of a pharmaceutical company and make a decision on which of three cholesterol-lowering drugs to market. All three drugs had been shown in pilot testing to be equally viable. Participants believed they would be asked to defend their choice in a discussion with two other people (actually research confederates). During the discussions, both confederates disagreed with the participant's choice and endorsed one of the other drugs instead. Importantly, one of the confederates mimicked the participants during the interaction and the other did not. Participants later rated the mimicking confederate as more confident and more persuasive than the nonmimicking confederate. Interestingly, however, the participants were not more persuaded by the mimicking confederate; that is, they were not more likely to adopt the mimicker's opinion than the nonmimicking confederate's opinion (see Van Swol & Drury, 2008a, for a similar finding).

9.2. Evidence for mimicry impacting persuasion

However, there is other research that has found differences in actual persuasion as a function of being mimicked or not. Bailenson and Yee (2005) used virtual reality technology to program digital avatars to either mimic the head movements of participants or to play back the head movements from a different participant. While the participants were wearing the virtual environment mask, the avatar delivered a persuasive appeal advocating a campus security policy that would require students to carry their student identification cards at all times. Avatars that mimicked participants were later rated as more persuasive and were evaluated more favorably on a series of trait measures. In contrast with the work by van Swol, however, avatars that mimicked actually persuaded more as well. That is, mimicked participants agreed more with the avatar's persuasive message than did nonmimicked participants. This is particularly noteworthy given that the interaction was not between two humans, but rather between human and avatar. Social influence still occurred as a result of mimicry.

Other evidence that persuasion is facilitated by mimicry comes from studies finding that being mimicked can influence the product preferences of consumers. Tanner et al. (2008) conducted two studies in which a "facilitator" told participants about a new snack product that was soon to be launched. The facilitator either mimicked the participants during

the interaction or did not. After learning about the product and answering some questions about the product category, participants were asked to taste the product and rate how much they liked it, whether they planned to purchase it themselves, and whether they would recommend it to friends. An index of favorability toward the product was computed from the responses to these questions in conjunction with the amount of the product they consumed (measured after they left).

The first study revealed that participants who had been mimicked by the facilitator had more favorable attitudes toward the product than those who had not been mimicked, although none of the participants attributed their attitude to the facilitator's behavior. In a second study, the facilitator told half of the participants that he was invested in the success of the product, and the other half that he was not invested. Intuition might suggest that the effect of mimicry should be attenuated if the facilitator is invested, because consumers may have their "guards up" in sales situations where they believe the person telling them about the product is biased or motivated to persuade. However, the authors made the opposite prediction: that the prosocial orientation induced by mimicry would lead participants to help the facilitator who was invested more than the facilitator who was uninvested. The researchers found that when the facilitator did not have a stake in the outcome, participants were more persuaded when he mimicked them than when he did not. Counterintuitively, this effect was even stronger when the facilitator was invested in the outcome. Thus, the prosocial orientation engendered by mimicry manifested itself as a greater tendency to like what was being presented. When the facilitator needed "help," mimicked participants liked the product more (in effect helping him) than nonmimicked participants.

9.3. Prosocial impact beyond the mimicry dyad

Mimicry clearly affects the dyad, making the interactions smoother and the interaction partners like, trust, and help each other more. That mimicry influences the emotions and behaviors displayed during an interaction is important because it is a process usually engaged in nonconsciously, and the effects it has therefore occur outside of the awareness (and intent) of the interaction partners.

However, researchers have recently proposed that being mimicked may lead to a change in one's social orientation. That is, mimicry may cause people to become more prosocial in general, not just toward the person whom they are mimicking or who is mimicking them, but to others as well. It is less intuitive that the effects of mimicry would go beyond the mimicry dyad. How would that manifest, and by what mechanisms would that occur? We next review the evidence for the impact of mimicry beyond the mimicry interaction.



10. MIMICKING OTHERS MAKES PEOPLE MORE PROSOCIAL

Stel et al. (2008) have found evidence that mimicking others makes individuals more prosocial. Participants either mimicked the facial expressions of a person shown on a video or not. They were then asked to donate money to a charity, which was either related to the person on the video or unrelated. Participants who were instructed to mimic (and who then in fact mimicked more) donated more to the charity (either related or unrelated) than those who did not mimic. A follow-up study found that affective empathy (defined as emotional contagion)—but not cognitive empathy—mediated the relationship between mimicking others and prosocial behavior. That is, mimicking the facial expressions of another led to picking up that person's emotions, which in turn led to helping others more. Because the mediator was found to be emotional contagion, this research suggests that the prosocial effects of mimicking others might be limited to (or stronger during) facial mimicry, which more readily leads to emotional contagion.



11. BEING MIMICKED MAKES PEOPLE MORE PROSOCIAL

Thus, mimicking others makes individuals more prosocial, but what about being mimicked by others? There is even more evidence for this link. In a study testing whether the prosocial feelings engendered by mimicry would extend beyond the dyad, Ashton-James et al. (2007) found that participants who were mimicked on an earlier task reported on a questionnaire that they felt closer to others in general, compared to those participants who were not mimicked during the earlier task. In a second study, an implicit measure of feeling close to others was used—seating distance. Participants were either mimicked or not, and then asked to take a seat in a hallway where several chairs had been placed side by side. Several items were placed on one of the end chairs such that it looked like another participant was sitting there (but had stepped away). The implicit measure of feeling close to an unknown other was how close to the “occupied” chair the participant sat. The researchers found that participants who had earlier been mimicked sat closer to the occupied seat than participants who had not been mimicked. This suggests that mimicked participants were feeling closer to others, and again supports the notion that the prosocial orientation engendered by mimicry goes beyond the mimicry interaction. People who are mimicked feel more prosocial towards others more generally.

Do mimicked individuals also *behave* in a more prosocial manner outside the dyad? Van Baaren et al. (2004a) found evidence for this in a study in

which an experimenter either mimicked participants or not, and then participants were brought to another room where a second experimenter “dropped” a bunch of pens. Participants who had been mimicked by the first experimenter helped the second experimenter (who did not mimic them) pick up more pens than those who had not been mimicked by the first experimenter. Thus, they became more helpful in general after being mimicked: they helped the first person they encountered who needed help, even when it was outside the mimicry dyad. In a follow-up study, van Baaren et al. (2004a) found that mimicked participants also donated more generously to a charity than nonmimicked participants. Thus, mimicry not only led to more helping of a person they encounter physically, but led to a prosocial, helping orientation that extended to groups of unknown others.



12. PROSOCIALITY LEADS TO MORE MIMICRY

Thus, mimicry leads to more prosociality. Is the reverse also true? In a study by Leighton et al. (2008), the reverse causal direction was explored: whether prosociality leads to more mimicry. Participants were primed in a scrambled sentence task with prosocial, antisocial, or neutral words, and then their ability to mimic was measured using a stimulus-response compatibility procedure that required them to perform a movement (e.g., opening hand) while looking at a (open) or incompatible (closed) hand movement. Results indicated that those who were primed with prosocial words were better at mimicking than those primed with neutral words, who in turn were better at mimicking than those primed with antisocial words. These findings confirm the bidirectionality of the relationship between prosociality and mimicry.

Interestingly, this measure of mimicry provides more evidence for the automaticity of imitation. Whereas most mimicry studies assume automaticity on the basis of absence of awareness of the mimicry, this study used a reaction time measure in which facilitated or inhibited responses constitute evidence for the automaticity.



13. SELF-CONSTRUAL MEDIATES THE MIMICRY-PROSOCIALITY LINK

What leads individuals who are mimicked to have a more prosocial orientation that extends beyond the mimicry environment? It has recently been suggested that it may be due to a fundamental shift in how people perceive themselves in relation to others. That is, Ashton-James et al. (2007) have suggested that the relationship between mimicry and prosociality is mediated by self-construal. The argument is that being mimicked causes

people to adopt an interdependent self-construal, which in turn leads to more prosocial feelings and behaviors. The first part of the prediction—that mimicry should lead to changes in self-construal—was derived from work by van Baaren et al. (2003b). These researchers had found that individuals with an interdependent self-construal—due either to priming or to chronic differences resulting from being from an Eastern culture—mimicked a confederate more than those with an independent self-construal.

Ashton-James et al. also found evidence for the reverse causal direction: that being mimicked leads individuals to have more interdependent self-construals. Moreover, this change in self-construal or way of viewing the self vis-à-vis other people led to more helping behavior. Participants were either mimicked or not by an experimenter in an initial interaction. They then completed the Twenty Statements Test (Kuhn & McPartland, 1954), which measures working self-concept by asking respondents to provide 20 different answers to the question, “Who am I?” These responses are later coded as either independent (e.g., personal attributes or traits) or interdependent (e.g., social roles, relationships). Next, participants were asked if they would be willing to fill out an extra survey for a researcher who could not pay them. The results supported self-construal as the mechanism by which mimicry leads individuals to adopt a more prosocial orientation towards others, including those outside the mimicry dyad. Specifically, participants who had been mimicked described themselves in a more interdependent manner and were also more likely to help the researcher complete the extra survey without pay. Importantly, interdependence was shown to mediate the relationship between the mimicry manipulation and volunteering.

These findings represent an important step toward understanding *why* mimicry leads to prosocial feelings and behaviors: there is a fundamental shift in the way people see themselves in relation to others after being mimicked. The other side of this same coin means that not being imitated decreases self-other overlap. A recent functional magnetic resonance imaging (fMRI) study by Van Baaren et al. (2008) observed just that. Participants in an fMRI scanner were instructed (block-design) to either think about a happy or sad recent experience. Within these blocks, subjects briefly saw pictures of sad and happy facial expressions. Their own facial expressions were therefore either congruent with the expression they viewed or incongruent. The data revealed that incongruent facial expressions, compared to congruent ones, led to more activation in the anterior cingulate cortex and the right temporal junction. This pattern of activation suggests a conflict/unexpected response (anterior cingulate cortex, ACC) and an increase in self-other distance, or allocentric and egocentric space (right temporo-parietal junction, rTPJ).

Thus, being mimicked and mimicking others appear to make people more prosocial, not just to the other person in the mimicry dyad, but to others more generally as well. When people are mimicked by others, they take on a more interdependent self-construal, which in turn makes them have a more prosocial orientation toward people in general.

13.1. The impact of mimicry on the individual

Thus mimicry impacts individuals in a prosocial way, both within and beyond the mimicry dyad. It brings people together psychologically and emotionally. It may or may not be surprising that the prosocial effects of mimicry linger—as a function of changing the way one sees oneself vis-à-vis others—to impact the way one feels and behaves toward other people. But it would certainly be surprising to many if mimicry had individual-level effects on the interaction partners that went beyond prosociality. It might be counterintuitive to suggest a nonverbal behavior like mimicry could affect things like the attitudes a person holds, how much self-control she is able to exert in a given situation, her cognitive processing style, or how well she does on a math test. And yet there is evidence for all of these effects.

We now review research that pushes the boundaries of mimicry impact beyond the prosocial to the individuals' cognitions, attitudes, and behaviors after the mimicry and social interaction is over. From this evidence we assert the following: (1) mimicking others affects the attitudes consumers hold about products; (2) not being mimicked can reduce self-esteem, which in turn can affect the way people perceive their relationships; (3) when individuals are mimicked more or less than implicitly expected, they have fewer regulatory resources to expend on subsequent tasks requiring self-control; (4) mimicry leads to a more field-dependent cognitive processing style; (5) mimicry leads people to behave in a way that confirms gender and racial stereotypes; (6) mood influences mimicry and vice-versa; and (7) being mimicked facilitates convergent creativity, whereas not being mimicked facilitates divergent creativity.



14. PREFERENCES FOR PRODUCTS

Research described earlier found that when consumers are mimicked, they feel more prosocial toward the mimicker, which can be manifested in more positivity toward products presented by that person. Tanner et al. (2008) have argued that there is another path by which mimicry can affect people's preferences for products. This route does not involve prosociality, and thus is described here as an individual-level consequence of mimicry. In this route, people mimic the consumption behaviors of others, and this in turn affects their own preferences for the products consumed.

In support of this idea, Tanner et al. (2008) had participants observe a confederate on a videotape. This confederate was eating exclusively from one of two snack bowls in front of him (one with goldfish crackers and one with animal crackers) while engaging in an unrelated task. While watching the confederate, some participants had bowls in front of them with the same two snacks available to eat, and others did not. The type and amount of snack eaten by the participant was measured, followed by a survey asking about

their snack preferences. Participants mimicked the snacking behavior of the confederate; if they had the snacks in front of them, then they consumed the same snack that the confederate consumed. Importantly, this went on to influence their attitudes. They reported more favorable attitudes toward the snack the confederate consumed, and mimicry mediated the effect of what the confederate ate on their own preferences. Participants who observed the confederate but were not able to consume the snacks themselves were not affected by the confederates' consumption behavior, suggesting that the results were due to mimicry and not to merely observing what the confederates ate. Importantly, participants did not recognize the role their own consumption mimicry played in their preferences.



15. SELF-ESTEEM

Another consequence of mimicry on the individual is that it affects self-esteem. Recent work by Kouzakova et al. (2008) examined what not being mimicked does to self-esteem and subsequent attempts to reconnect to others. In one of their studies, participants were asked how happy they were in a relationship with a significant other. Then they were either mimicked or not by a confederate. After this manipulation, they completed a self-esteem IAT, once again received a relationship satisfaction questionnaire, and then carried out a second measurement of the self-esteem IAT. The results showed that nonmimicked participants had lower implicit self-esteem compared to mimicked ones. More importantly, however, nonmimicked participants rated their relationship with an important significant other more satisfactory compared to the baseline measure taken before the mimicry manipulation. In the mimicry condition, there was no such increase. Furthermore, the increase in relationship satisfaction demonstrated by nonmimicked participants mediated the subsequent repair in self-esteem; after an initial drop in self-esteem, evaluating their significant relationship more favorably allowed participants to restore their self-esteem.



16. SELF-REGULATION

Most research thus far has focused on the positive consequences of mimicry, and with good reason. There is strong evidence to suggest that it leads to liking, empathy, helping, and smooth interactions. What if mimicry is poorly coordinated—does it have negative consequences? Can the presence of mimicry itself lead to negative outcomes? These were some of the questions addressed by Dalton et al. (2008), who examined the self-regulatory consequences of mimicry. The researchers drew on previous work finding that poorly coordinated social interactions burden one's

self-regulatory resources (Finkel & Campbell, 2001; see Finkel et al., 2006), leading to worse self-control, more resource depletion, and less ability to regulate one's actions. Are there basic self-regulatory consequences of well-coordinated or poorly coordinated behavioral mimicry? The authors proposed that poorly coordinated mimicry can disrupt the nonconscious social coordination processes that normally occur automatically, which in turn increases the effort required by a social interaction. Participants in a series of studies engaged in a two-task paradigm. First, they interacted with a confederate who either mimicked or not their mannerisms, gestures, and other motor movements. Next, participants were brought to a room on their own in which they completed a self-regulatory task that required self-control. These self-regulatory tasks measured things ranging from fine motor skills to consumption of junk food to procrastinating on a math task. Results found that mimicry or a lack thereof during the first task affected participants' performance on the second task such that they did better if they had been mimicked than if they had not. For instance, mimicked participants ate less junk food, displayed better fine motor control, and procrastinated less than those participants who were not mimicked. Another study found the effect was driven by no mimicry. That is, no mimicry depletes regulatory resources, rather than mimicry replenishing regulatory resources.

16.1. Mimicry as schema-driven

So is a lack of mimicry in itself depleting? Dalton et al. (2008) argued no, that a lack of mimicry isn't necessarily depleting, but rather depends on what is consistent with the expectations for a given type of social interaction. Specifically, they reasoned that mimicry is an automatic schema-driven process, and as such, if it is poorly coordinated, or exists when unexpected or not part of the active schema driving the interaction, then self-regulation should suffer. Thus, mimicry or a lack of mimicry can be depleting, depending on whether it is consistent or not with one's expectations for the current interaction.

16.1.1. Cross-race Interactions

One type of interaction that may often be characterized by a lack of mimicry is cross-race interactions. Research suggests that nonverbal behaviors differ between same-race and cross-race interactions, and that although the presence of mimicry might be schema-consistent during same-race interactions, a lack of mimicry would be consistent with the nonverbal behaviors characterizing cross-race interactions (less smiling and eye-contact, etc.). Accordingly, Dalton et al. (2008) predicted that a lack of mimicry would be depleting during same-race interactions, but the presence of mimicry should be schema inconsistent, and therefore depleting, during cross-race interactions. To test this hypothesis, participants were mimicked or not by a

confederate of the same race or different race. They then completed a Stroop interference task to assess regulatory depletion. Results confirmed that interactions with no mimicry impaired self-regulation of people in same race interactions but interactions with mimicry impaired self-regulation of people in cross-race interactions. Interestingly, although mimicry depleted participants in cross-race interactions, the other, prosocial consequences of mimicry held up: participants still reported enjoying the mimicry interactions more (in spite of their reduction in self-regulatory resources).

This latter finding, being imitated by an outgroup member leads to more liking, seems to contradict the previously mentioned studies by Likowski et al. (2008) where mimicry by an outgroup member decreased liking. It is important to note that both the study by Dalton et al. (2008) and Likowski et al. (2008) did not measure *a priori* liking towards the outgroup. This was addressed in a recent study by Wigboldus et al. (2008) which showed that the consequences of being imitated by an outgroup member are moderated by implicit prejudice. The head movements of white Dutch participants were mimicked or not by an avatar in an immersive virtual environment. For half the participants, the avatar was Dutch looking, for the others he was Moroccan looking. The results showed that for low-prejudiced people, the “normal” effect of being mimicked occurred: a mimicking avatar was evaluated more positively than a nonmimicking avatar. Importantly, this effect was reversed for high-prejudiced participants who were mimicked by an avatar with typical Moroccan features; they evaluated the mimicking avatar less favorably compared to the nonmimicking one.

16.1.2. Power discrepancies

Interactions between individuals with different amounts of power may also be guided by mimicry schemas. Those individuals with relatively more power are mimicked more than those with relatively little power (Cheng & Chartrand, 2003). Thus, an individual interacting with a more powerful other may not (nonconsciously) expect to be mimicked, whereas an individual interacting with a less powerful other may expect to be mimicked. This was tested in a study similar to the cross-race/same-race study described earlier. Participants were told that in a task that followed, they were going to be a leader (worker), interacting with another “participant” (actually a confederate) who was going to be the worker (leader). Again, performance on a Stroop interference task was used as the measure of regulatory resources. Results confirmed that “workers” did better on the Stroop task if they were not mimicked than if they were mimicked. In contrast, “leaders” did better if they were mimicked than if they were not mimicked. Again, this suggests that it is not a lack of mimicry *per se* that drains one’s regulatory resources; it is the violation of what is implicitly expected during an interaction. During interactions that are normally

characterized by a lack of mimicry, being mimicked has a depleting effect and reduces one's self-control.

The studies linking mimicry to self-regulation emphasize that mimicry goes beyond affecting the prosociality of the individuals involved in the interaction. Mimicry also has a nonsocial impact on the mimicked individuals. Not only does mimicry facilitate positive social interactions, but it also can save much needed cognitive resources when that mimicry is well-coordinated and matches one's mimicry schema for that type of interaction. It also highlights the important point that mimicry is not always a "good" thing, leading to desired outcomes. There are conditions under which the presence of mimicry can have a negative impact on the individuals involved.



17. COGNITIVE STYLE

Another individual-level consequence of mimicry is the cognitive processing style with which individuals perceive and understand their current environment. van Baaren et al. (2004b) noted the link between mimicry and greater environmental attunement, and tested whether this link might extend to processing style as well. Because field-dependent processing is characterized by a greater attunement to and reliance on contextual details, the authors hypothesized that mimicry should be linked to this type of processing (as opposed to field-independent processing, which is characterized by not taking the environment or context into account as much). The researchers indeed found a correlation between field dependent processing and a greater tendency to mimic a target person's behavior. Moreover, in a study in which participants were mimicked or not by a confederate in a previous interaction, they became more context-dependent in their processing style if they were mimicked than if they were not. The researchers also found evidence for the reverse causal direction: participants who were induced to use a context-dependent processing style mimicked a target's person's behaviors more than those who were induced into using a context-independent processing style. These studies provide further evidence that mimicry is enhanced by factors that are associated with greater attunement to one's context or current environment.



18. STEREOTYPE CONFORMITY

The research discussed above suggests that mimicry leads to a greater reliance on the environment. Specifically, mimicry is associated with a variety of indicators of increased sensitivity to and reliance on social cues. Individuals who are mimicked perceive the environment in a more field-dependent

fashion, have a more interdependent self-construal, and are higher in perspective taking and affiliation motivation, suggesting a reliance on others and a willingness to comply with their behavioral expectations. Thus, by enhancing field dependence, interdependence, perspective taking, and affiliation motives, mimicry has been shown to increase sensitivity to the social environment and reliance on social cues. In turn, each of these specific indicators of social responsiveness has been found to lead to greater stereotype conformity (see Leander et al., 2008, for a review). Thus, the increased reliance on social cues engendered by mimicry may lead individuals who are mimicked to conform more to shared social stereotypes. As a result, Leander et al. (2008) hypothesized that people who are mimicked by others subsequently behave in stereotypic ways.

The results of three studies supported these predictions. In a first study, participants interacted with a confederate who either mimicked their nonverbal behaviors or not, and then completed a math task. Consistent with social stereotypes about math performance, mimicry by a confederate worsened women's math performance (but not men's). In a second study, participants were male Asian-American, female Asian-American, male Caucasian-American, and female Caucasian-American. Although men are stereotypically thought to be better at math than women, there is also a stereotype that Asian-Americans are better at math than Caucasian-Americans. Participants were mimicked or not in a first task by a confederate and then completed a math task. Mimicry boosted the math performance of the Asian-American men, but not of Asian-American women, or of Caucasian-American men or women. In a third study, the researchers found that the female performance decrement engendered by mimicry is stronger for those women who believe in the existence of the traditional gender role stereotype. These results suggest that the increased sensitivity to the environment shown in previous research to be activated by mimicry can be manifested in conformity to shared gender and racial stereotypes. These findings (in conjunction with the ones on regulatory resource depletion) are the first to demonstrate a potential negative consequence of mimicry.



19. Mood

As reviewed above, one's mental state influences mimicry and vice versa. But what about one's emotional state? Given that a positive mood leads people to rely more on automatic processes, whereas a negative mood leads people to rely on more deliberate forms of action, van Baaren et al. (2006) proposed that people in a good mood should mimic others more than people in a bad mood. Participants in one of their studies were put in a positive or negative mood via a funny or sad videoclip. They were then told

that they would be listening to two short pieces of music in the next part of the study. They again were directed to the television screen, where they watched an experimenter start the first piece of music. In actuality, the “live feed” was a prerecorded video. The experimenter remained on the screen while the music played. A new, second experimenter was then depicted on the screen during the playing of the next piece of music. In one of the video segments (order counterbalanced), the experimenter was playing with a pen, and a hidden videocamera recorded participants’ own pen-playing behavior while watching the two video segments. Results indicated that participants in a positive mood played with their pens more when watching the pen-playing experimenter than the non-pen-playing experimenter. In contrast, participants in a negative mood did not play with their pens more when they viewed the pen-playing experimenter. That is, participants in a good mood mimicked, but those in a bad mood did not.



20. CREATIVITY

There are two types of creativity: convergent creativity (“connecting the dots”) and divergent creativity (“thinking outside the box”). Both are important skills that people use in their daily lives, with some problems or tasks requiring one type of creativity and other problems or tasks requiring the other type. Because mimicry brings people together and leads to a convergence in attitudes, Ashton-James and Chartrand (2008) hypothesized that mimicry would facilitate convergent creativity, whereas a lack of mimicry would facilitate divergent creativity.

A first study used a pattern recognition task as a measure of convergent thinking. Participants who were mimicked had a higher number of correct completions for the pattern recognition items than those who were not mimicked. In a second study, participants were mimicked or not by an experimenter, then asked to complete the “unusual uses task,” which requires them to list as many different uses for a brick as possible. Ratings of “unusualness” were used as a measure of divergent thinking. As expected, participants who were not mimicked came up with more unusual uses for a brick than participants who were mimicked. Thus, being mimicked makes one better at convergent thinking but worse at divergent thinking.

What mediates this effect? Positive mood has been linked to convergent creativity and negative mood to divergent creativity. Yet previous research has not found influences of mimicry on mood (van Baaren et al., 2004a). However, this previous research used self-report measures of mood, and perhaps mimicry, as a nonconscious process that stays “below the radar,” affects implicit mood but not explicit mood. That is, a sensitive implicit measure might pick up on mood effects that more explicit measures do not. Ashton-James and Chartrand (2008) tested whether implicit mood mediates

the effects of mimicry on creative thinking. Using a different measure of convergent thinking—the Remote Associates Task (RAT)—they again found that those who were mimicked performed better on this task than those who were not.

Importantly, this study also found evidence for their proposed mechanism: positive affect. Participants filled out an implicit affect measure by completing a number of word stems that could be completed in a positive or negative way. Those who were mimicked had more positive implicit affect than those who were not mimicked, and this mediated the impact of mimicry on convergent thinking.



21. EVALUATIONS OF EXPERIENCES

In the study by Ramanathan and McGill (2008) described earlier, participants who saw a movie with another person converged in their moment-to-moment evaluations of the movie if they could see each other, compared to if their view of the other person was blocked. Interestingly, this coherence in evaluations led to more positive retrospective evaluations of the experience. People who were able to mimic another and converge in their moment-to-moment evaluations of the program with that person ended up liking the program more as a result.

Thus, mimicry has impact that goes well beyond prosociality: being mimicked (or *not* being mimicked) influences one's willpower or self-regulatory resources, moods, academic performance, cognitive processing style, creativity, consumer preferences and evaluations, and attitudes. This is a broad array of cognitive, affective, motivational, and attitudinal effects, and for them all to be impacted by the nonverbal behavior displayed during an interaction is quite remarkable.



22. THEORIES OF MIMICRY

Now that we have reviewed the empirical data on the moderators and consequences of mimicry, the next step is to evaluate what this means for theories of *why* we mimic. Ultimately, a good theory of mimicry should be able to explain the social function, the cognitive mechanisms involved, and the neural underpinnings. In our view, there is not yet one single theory capable of accomplishing this. However, several proposed theories are capable of explaining various aspects of mimicry. We will start with the evidence for mimicry as a communication tool and the function it serves in making our interaction partners know that we understand and empathize with them. Then, we will turn to the view of mimicry as an automatic

product of the direct coupling between cognition, perception and action. Furthermore, we discuss the neurological evidence for this perception-behavior link. We present a conceptualization of mimicry as driven by hard-wired neural architecture with flexible manifestations. Finally, despite the inherent difficulty of answering the question of *why* we mimic, we will briefly address the possible evolutionary reasons for this ubiquitous tendency.

22.1. Mimicry as communication tool

Nonverbal behavior has long been thought to serve a communicative function (e.g., Schefflen, 1964). For instance, Kraut and Johnston (1979) found that people were more likely to smile in response to happy situations when there was another person around than when alone, which suggested that the smile served a communicative function. As a nonverbal behavior, mimicry has also been thought of as a communication tool. This theory suggests that mimicry communicates understanding and togetherness and as a result, creates an empathic bond between interaction partners that leads to positive social outcomes (Bavelas et al., 1988; Bernieri, 1988; Condon & Ogston, 1966; Condon & Sander, 1974; LaFrance, 1979, 1982).

Bavelas et al. (1986) tested whether mimicry is an inherently social phenomenon and whether it is received as a nonverbal message conveying similarity or togetherness. In a first study, participants watched two experimenters moving a television into the lab room in which they were sitting. One of the experimenters appeared to have an injured finger (was wearing a finger splint). The television then was rigged to appear to crush the splinted finger as the experiments moved it in front of the participants. In one condition, the injured experimenter looked at the participant while being hurt by the TV, and in the other condition, he hunched forward while being injured so that the participant could only see his profile. Results revealed that participants who witnessed the experimenter wince often winced themselves in response, and the size of the winces reflected how well they could view the wince on the experimenter's face. The authors concluded that mimicry is an interpersonal response—it occurred to a greater degree if the interactants could see it occurring. But is mimicry a tool of communication? The authors tried to show in another study that the facial expressions displayed were somehow meaningful to others. Raters were given videotaped excerpts of participants watching the staged injuries, and the judges were asked to rate the facial expressions of the participants on several dimensions. The naïve judges only saw the participants (not the experimenter), so that they did not know what condition the participants were in. The facial expressions of participants who saw the face of the injured experimenter were judged to be more caring, knowing, and appropriate than those who only saw the experimenter's facial profile.

The researchers concluded that mimicry functions to communicate an observer's vicarious response to an interaction partner.

The results discussed previously by Stel et al. (2008)—that mimicry *does* in fact communicate liking and understanding to the person being mimicked—further support the notion of mimicry as a communication tool. However, there are also studies that find mimicry among individuals who are alone and watching a videotape (Bavelas et al., 1986; Hsee et al., 1990; Lakin & Chartrand, 2003; Van Baaren et al., 2007). Why does mimicry occur under these circumstances? The key to reconciling this apparent discrepancy may lie in whether the behavior being mimicked is related to feelings or emotions. When it comes to emotional contagion, there may be a strong communicative reason behind our tendency to imitate. In fact, the communication function may be limited to instances when emotions are involved. In the videotape studies, the mimicry was not emotional in nature. Thus, although mimicry may result in increased empathy, liking, rapport and prosociality, it also occurs in situations where there is no human present (e.g., looking at a photograph or TV-screen). There needs to be an additional, more fundamental reason for mimicking that goes beyond a solely strategic communicative one.

Chartrand and Bargh (1999) argued that nonconscious mimicry is a passive and automatic response. They based this argument on the results of funnel debriefings at the end of the experiments that were designed to probe for awareness of the mimicry. Participants indicated no awareness that they mimicked their interaction partners. Moreover, mimicry occurred in their studies under minimal conditions, among strangers with no goal to affiliate with each other. Thus, they concluded that mimicry must not depend on the presence of a communication or affiliation goal during the interaction. They suggested that a “perception–behavior link” might be the mechanism driving mimicry, at least under these “minimal conditions.” That is, mimicry may be an automatic result of how our brains are wired. They argued that due to a strong link between perception and action, observing a behavior increases the chances of overtly or covertly copying it. In the next section, first we discuss the link between thinking about an action and actually performing it, whereafter we will shift from *thinking* to *perceiving* an action and its effects on our own behavior.

22.2. Ideomotor action

Carpenter (1874) and James (1890) were the first to argue for a link between thinking and doing. This principle of ideomotor action occurs when the mere act of thinking about engaging in a behavior increases the likelihood of actually engaging in that behavior. The regions of the brain that become active on thinking about an action are the same regions that become active when we engage in that action ourselves.

There is evidence from fMRI and Positron Emission Tomography (PET) that support the principle of ideomotor action. Jeannerod and colleagues (Decety et al., 1991; Jeannerod, 1994, 1997) found that mentally simulating activities such as weightlifting and running activate the same premotor cortex neurons in humans as performing these activities. Paus et al. (1993) similarly found that thinking about words or gestures activates the same brain regions as saying these words or performing these gestures do.

Recently an additional paper on the *ideo-motor link* has looked at how automatic mental simulation of *someone else* performing an action influences our own actions. Sebanz et al. (2003) used the Simon Task, a spatial compatibility task (Craft & Simon, 1970; Simon, 1990), to test whether perception of others activates a cognitive representation for that action in the self. Participants looking at a computer screen saw a finger wearing either a red or green ring. They were told to ignore the direction in which the finger was pointing and instead simply indicate its color. Some responses were compatible (in which the finger was pointing toward the correct button), incompatible (finger was pointing towards the incorrect button), or neutral (in which the finger was pointing forward). For those participants who completed this task alone, the results uncovered a spatial compatibility effect, such that responses were faster on compatible trials than incompatible trials. Another group of participants responded either to only the red rings or only the green rings (a go/no-go version of the Simon Task), and again completed it either individually (e.g., responding only to red and ignoring green) or with a partner (if responding to red and ignoring green, the partner would respond to green and ignore red).

Sebanz et al. (2003) found that whether the task was performed either individually or next to a partner had an influence on the pattern of performance. Participants doing the task individually had fast response times for all types of trials. But when the task was done with a partner, response items were faster on compatible trials than incompatible trials. Their performance suggested a spatial compatibility effect, just like the first group of participants who completed the task alone. Spatial compatibility effects usually would not occur in this condition because participants only need to respond to one stimulus. The authors argued that participants working with a partner mentally represented their partner's action in the same way they represented their own, and because the representations involved with perceiving the actions of the partner are the same that would become active when perceiving and planning one's own actions, participants performed as though they were responding to both the red and green rings.

Note that this is not yet direct evidence for a automatic link between observing someone else perform an action and our own action because the studies examined mentally simulating and thinking about, not perceiving, another person's behavior. However, there is evidence for a perception-behavior link as well. But first we turn to theoretical accounts of such a link.

22.3. Perception-behavior link

There are several cognitive theories explaining the existence of a perception-behavior link (for a review see Dijksterhuis & Bargh, 2001). For example, the common-coding hypothesis (Prinz, 1990, 1997) is a shared representational system for perception and behavior that extends the principle of ideomotor action to perception of events and actions, and to mimicry. The representations of action automatically lead to actual behavior after a certain threshold level of activation is reached. Brass et al. (2001), for example, demonstrated in a reaction time paradigm that observing someone perform a certain finger movement facilitates one's own execution of that same finger movement while also interfering with one's own execution of a different finger movement.

Another, somewhat different conceptualization of the perception-behavior link involves schemas (Barresi & Moore, 1996). Whereas the common coding account posits shared systems in the brain, the schema account is based on basic rules of cognition. Schemas that are activated when a person engages in an action overlap semantically with the schemas that are activated when a person perceives the actions of others. As a result of these overlapping representations, the two types of schemas are often active at the same time. Thus, perception leads to action, and action also leads to perception—that is, to interpreting a behavior in a certain way (Berkowitz, 1984; Carver et al., 1983; Mussweiler, 2003).

Barresi and Moore (1996) argue that schemas impose structure on different sources of information, and as a result, first- and third-person information cannot be confused, nor can imagined and actually perceived information be confused. Thus, when a person perceives her own behavior, the same system is involved in perception and action, but when she perceives another person's behavior, different systems are involved in perception and action. This implies two things, both of which have received support. First, people should be (and are) better at recognizing themselves than others (Beardsworth & Buckner, 1981; Knoblich & Prinz, 2001; Repp, 1987). Second, people should be (and are) better able to predict the future effects of their own behaviors than the effects of other people's behaviors (Knoblich & Flach, 2001).



23. NEUROPSYCHOLOGICAL EVIDENCE FOR PERCEPTION-ACTION: MIRROR NEURONS

The discovery of “mirror neurons” in macaque monkeys and a similar mirror system in humans has provided empirical support for an intimate link between perceiving an action and performing the same action (Iacoboni

et al., 1999; Koski et al., 2002; Metzinger & Gallese, 2003; Rizzolatti et al., 2001; for a review see Hurley & Chater, 2005). Mirror neurons are neurons that fire both upon perceiving another engage in an action, and upon oneself engaging in the action. There is evidence with nonhuman subjects that supports the existence of these neurons (Gallese et al., 1996; Rizzolatti & Craighero, 2004; Rizzolatti et al., 2001; Rumiati & Bekkering, 2003). For instance, there are clusters of neurons in the brains of macaque monkeys that are activated both when watching a person grabbing a peanut, and when grabbing a peanut themselves (Gallese et al., 1996). These neurons seem not to differentiate between actions performed by others and actions performed oneself.

In humans, functionally similar effects have been observed (Grossman et al., 2000; Ruby & Decety, 2001). Fadiga et al. (1995) found that perceiving a target grasp an object and grasping the object oneself results in similar muscular responses (see also Musseler & Hommel, 1997a,b). Furthermore, perceiving hand movements activates the same cortical region as performing those hand movements oneself (Iacoboni et al., 1999). Moreover, perception of a certain behavior automatically activates our own motor representation of that action (Decety & Chaminade, 2005; Iacoboni et al., 1999; Rizzolatti et al., 2001). In addition, mirror phenomena involving disgust (Wicker et al., 2003), pain (Morrison et al., 2004) and auditory stimuli (Keysers et al., 2003) have been reported. The human mirror system is thought to consist of bilateral premotor and inferior parietal cortices, where mirror activity has been observed. Thus, a substantial part of the human brain is active both when observing and when executing an action.



24. ARE WE BORN TO MIMIC?

It is tempting to interpret the discovery of the mirror neuron system as a complete answer to the question of how we mimic. Does the presence of a mirror system in the human brain imply that we are born to imitate and that mirroring is the only automatic behavioral response to perceived action? That is, do mirror neurons lead inevitably to imitation?

One of the strongest pieces of evidence in favor of the innateness of imitation comes from the work by Meltzoff and Moore (1977a,b), which showed that very young infants, even one infant of only 42 min, showed facial imitation. This would exclude a learning explanation of imitation and strongly suggest we are born imitating. However, more recent analyses of all the evidence in favor of neonatal imitation (Anisfield, 1996) came to the conclusion that the evidence actually is very thin and reliable effects have been obtained only for tongue protrusion. However, further research failed to find imitation of tongue protrusion in infants, and Jones (2006) described

how other stimuli (visual and auditory) increased the tongue protrusion response in very young infants, suggesting that tongue protrusion may not be an effect of imitation per se, but a response to a broader range of stimuli. In sum, the evidence for innateness of imitation is weak at the moment.

The second debate centers around the question of whether mirror neurons always trigger “mirror” responses. It is tempting to get overly excited by the discovery of mirror neurons and take them to explain our seeming default tendency to mimic. However, recent compelling evidence suggests that there is nothing innately “mirror” about the mirror system. In several papers, the flexibility of the mirror system is illustrated. Catmur and colleagues (Catmur et al., 2007, 2008), for example, illustrated that one can change or even reverse the response in the mirror system through training. For example, they trained participants to either respond to hand movements with hand movements and foot movements with foot movements (compatible condition) or to respond to foot-movements with hand movements and vice versa (incompatible training). First, their results showed that the facilitation effect normally observed in compatible situations is actually reversed in the incompatible training condition; that is, participants after training were faster to respond with a foot movement upon observing a hand movement and vice versa.

Further, fMRI imaging data showed that the action observation properties in the mirror system were actually reversed. Whereas the mirror system showed greater response to hand observations in the compatible condition, these same areas responded more to foot observations in the incompatible condition. Transcranial Magnetic Stimulation (TMS) data on compatible and incompatible hand opening/hand closing perception-action couplings showed conceptually similar results on a muscular level. More evidence for the idea that the mirror system is involved in complementary actions, and not just mirroring actions, comes from a recent study by Newman-Norlund et al. (2007). The authors showed that activity in the mirror system was actually greater during preparation of *complementary* action (e.g., grabbing a cup by the handle when it is handed to you by the cup itself) than imitative action.

Another line of research providing evidence against a rigid view of imitation comes from social psychological studies related to Interpersonal Circumplex Theory and complementary behavior in situations of hierarchy or power (e.g., Wiggins, 1982). Tiedens and Fragale (2003), for example, observed that in behaviors that signal dominance or submissiveness (e.g., expanding the body or constricting it), which they call *power moves*, people actually automatically and without awareness respond in a complementary, not imitative, way. Dominant behavior primes submissive behavior and vice versa.

In sum, it may actually not be mimicry or mirroring that is innate, but the architecture that produces it (the mirror system). But this same system,

under different conditions or in a different context, can also lead to complementary or other behaviors. It then depends on what motor response is associated with what perceptual input. In most cases and in typical human development, those associations will be mirror-like; however, that does not mean that mirroring is the only automatic behavioral response.

Two fairly recent theories in cognitive and neuropsychology are in line with a view of mimicry as not necessarily innate or inevitable: Heyes' Associative Sequence Learning theory on sensorimotor associations (e.g., Heyes & Bird, 2007) and Keyzers and Perrett's Hebbian Perspective on the mirror system (Keyzers & Perrett, 2004). The gist of these theories is that the mirror system acquires its mirroring properties from learned associations between perceptions and associated actions. Neurons that wire together fire together. When a certain motor behavior is continuously (baby waving hand) and consistently associated with a certain perception (seeing hand wave or seeing mama waving), these representations will be strongly linked together and will become capable of mutual activation. This would also explain how humans can sometimes automatically show complementary behavior instead of imitative behavior. If we learn through experience that the best response to a dominant posture is adopting a submissive posture ourselves (and in this way stay out of trouble or worse), these sensory-motor couplings may become capable of mutual activation. The findings on the relation between implicit associations and moderation and consequences of mimicry (e.g., Stel et al., 2008; Wigboldus et al., 2008) would be in line with our flexible view on mimicry.

Another finding that fits with an associative account of mimicry is that most of the imitation occurring in mother-child interactions consists of the mother imitating the child. This may actually be part of an important associative learning experience in the baby. Whereas for hand and foot behaviors, there is visual feedback of the action, for facial expressions and movements, there isn't. Being mimicked by parents may thus provide important visual feedback. Through time and experience, these visual consequences become associated with the movements that produced them. As Hebbian learning dictates: neurons that fire together, wire together. So in time, the facial expression of the mother (or father) will lead to the production of the same movement or expression in the baby.

In sum, mirror neurons, or the mirror system, seem to "embody" the hypothesized perception-action link. However, more research is needed to understand what exact role this system plays in the mimicry domain. In addition, the social psychological studies on the moderators and consequences described in this paper await further investigation. Even if mirror neurons mediate mimicry, it still is unclear how mindsets such as self-construal, cognitive style, mood and prosociality can moderate this activity. Furthermore, it is unspecified how the prosocial and individual-level consequences of mimicry are represented on a neural level.

Despite these questions, recent research already has made considerable progress in trying to tie together subjective feelings and perception–action. For example, the relation between perception–action and empathy has been investigated thoroughly in recent years (for reviews see, Decety & Jackson, 2004; Preston & De Waal, 2002). The results suggest that the perception of emotions partly activates the same neural mechanisms that generate those emotions.

25. MIRROR SYSTEM AND EMPATHY

Researchers have examined the neural mechanisms involved in empathy (Jackson et al., 2005). In an MRI study, participants were shown photos of people with their hands and feet in either painful or nonpainful situations. After being given either a “self” or “other” perspective, they were asked to rate how painful the photos were from these perspectives. Interestingly, there were many similarities in the neural networks involved in processing pain from a “self” perspective and from an “other” perspective. Decety and others have argued on the basis of this and other research that the neural architecture involved with the pairing of perception and action plays a meaningful role in the experience of empathy (Decety & Jackson, 2004; Goldman, 2005; Meltzoff & Decety, 2003; Preston & de Waal, 2002). But Jackson et al. (2005) noted that there were also some important differences in the neural networks involved in processing pain from a self versus other perspective. The researchers concluded that empathic responding is not the same as self-responding. That is, we don’t literally “feel the pain of others”; we understand the predicament of others and feel some of their pain but we are able to behave *to* them and not *with* them.

Research on contagious yawning (Provine, 1986) also sheds light on this link between empathy and mimicry. Researchers have long argued that the mimicry of yawns is a sign of empathy (Lehmann, 1979), and it was described as a primitive manifestation of the capacity to empathize with other people. Recent neuropsychological research has accumulated that finally supports this theoretical link between yawning contagion and empathy. Platek et al. (2003) found that vulnerability to yawning contagion was positively correlated with various indicators of empathy, such as performance on theory of mind tasks and a self-face recognition task. Platek et al. (2003) argued that unconscious empathy leads to contagious yawning, and unconscious mental simulation by mirror neurons might mediate this effect. Platek et al. (2005) provided fMRI data on the neural substrates of yawn mimicry. When a person sees someone else yawn, the brain areas involved in self-processing are activated, and as a result, the authors concluded that contagious yawning is part of the neural network involved in empathy.

Further evidence for a role of mimicry in empathy comes from work on perspective taking. Perspective taking ability is the cognitive form of empathy (Davis, 1984), and there is evidence for a relation between this and mimicry as well. As mentioned earlier, Chartrand and Bargh (1999) found that individual differences in perspective taking moderated the extent of mimicry such that high perspective takers mimicked more than low perspective takers. In another study testing the relation between perspective taking and mimicry, Wallbott (1991) found that when people try to understand the emotions of others, they spontaneously mimic the facial expressions that they see. Importantly, the more they mimic, the more accurate they are at understanding which emotional expression is being conveyed.

Other researchers have explored the neural substrates involved in imitation and perspective taking in fMRI studies (Jackson et al., 2006). Participants were told to watch a video clip of a person performing a simple hand or foot action. Some clips depicted the actions from the first person and some from the third person perspective. Participants were also instructed to either passively observe the videos or to mimic the actions performed in them. Results revealed that motor production systems were activated both when actions were observed and when they were imitated. However, there was more activation in the motor production system from the first person than the third person perspective. Samson et al. (2005) found that lesions to the regions involved in third person perspective impair the ability to take the perspective of others. This suggests a common biological system that links these various social responses.

The work of other researchers suggests that mimicry is crucial for perspective taking to happen (Adolphs et al., 2000). In a study investigating the ability of participants to categorize the facial expressions of others, Adolphs et al. (2000) found that individuals with a lesion in the somatosensory cortex performed worse on this task. They couldn't judge the emotional expression of others, presumably because their lesions precluded mimicry from occurring, which in turn precluded somatosensory feedback that is necessary in understanding the emotions expressions of others. Thus, mimicry appears to mediate the relation between neural substrates and social responses.

In sum, the arguments that mimicry and perspective taking are supported by the same underlying neural circuits have garnered considerable support. Importantly, there is also evidence that mimicry might mediate this link between the neural and the social responses. At a minimum, there appears to be interdependence in the social responses of mimicry and perspective taking. Thus, mimicry appears to be associated with empathy, and empathy and mimicry are rooted in the brain architecture implicated in the perception-behavior link. In addition, the relation seems to be bidirectional; mimicry influences empathy and empathy influences mimicry.



26. MOTIVATION AND THE MIRROR SYSTEM

Another striking aspect of the many social psychological experiments on mimicry is that mimicry is influenced by mind-sets, or general mental states, such as self-construal, cognitive style, mood, and prosociality. For a mirror neuron account of mimicry, this would imply that mirror neuron activity should be modulated by motivational or other mindsets.

In a recent fMRI study, Cheng et al. (2007) obtained evidence for a motivational effect on activity in the mirror system. In this case, one of the strongest motivational states—hunger—was used. Half the participants arrived at the lab hungry for a two-session scanning experiment. In both sessions, which were identical, participants watched video clips of people grasping objects or grasping food. Between the two sessions, the hungry participants were given a meal, so the first session (hungry) could be contrasted against the second session (satiated). The participants who already arrived at the lab in a nonhungry state functioned as a control group for potential session effects. First, the results revealed that hungry participants, upon watching food-related items, showed more activity in drive and motivation related areas, such as parahippocampal gyrus, amygdala, and orbitofrontal cortex. More importantly, when participants were hungry and when they were observing a target grasping food, they showed increased activity in the mirror system.

It will be a great challenge in future research to understand how our brains detect unobtrusive mimicry, and how that subsequently leads to an interdependent self-construal, a more prosocial orientation, being more persuaded, and so on. Despite all these questions, the evidence for a direct link between perception and action (whether mirror or complementary) is overwhelming and the mimicry described in this paper is most likely a result of this intimate link. Although we may now have a better understanding of *how* we mimic, the more difficult question to answer is *why* we mimic.

An evolutionary account of mimicry has been proposed previously (Chartrand et al., 2005; Lakin et al., 2003). Central to this account is that mimicry serves important social functions and can be conceptualized as a “social glue.” Mimicry is both a result and facilitator of positive social interactions, which may be of vital importance in human life. Human society can be characterized by a heavy reliance on connectedness and affiliation and humans have a strong need to belong (Baumeister & Leary, 1995). Given that mimicry is an ideal (low-cost, low-effort) means to regulate this need to belong, there may be evolutionary pressure in humans to use it effectively. An additional finding in social psychological studies that attest to the evolutionary benefit of mimicry (discussed earlier) is that mimicry is sensitive to ingroup–outgroup distinctions. We mimic

outgroups less or not at all and do not feel more connected after being mimicked by an outgroup member about whom we hold negative views. Mimicry helps in regulating our interactions with our friends and foes.

What should we conclude about human mimicry? That it is pervasive, certainly, and that it often occurs automatically, without the awareness or intent of the mimicker and without being noticed by the mimickee. Our cognitive and neural architecture certainly facilitates automatic mimicry, although this architecture does not inevitably lead to a mirroring response. The impact of mimicry is broad and deep. Not only does it foster prosociality by bringing the members of the mimicry dyad closer together cognitively, affectively, and behaviorally; it changes the way one perceives oneself in relation to others, thereby inducing a general prosocial orientation that goes beyond the mimicry dyad. Most strikingly, mimicry has effects on the individuals involved that are not related to prosociality. The way a person thinks, self-regulates, feels, and behaves in a given moment in time is influenced by the presence or absence of mimicry in preceding social interactions. Given its impact, it is important to continue exploring the manifestations, antecedents, moderators, mechanisms, and consequences of human mimicry.

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OSTRACISM: A TEMPORAL NEED-THREAT MODEL

Kipling D. Williams

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Abstract

The phenomenon of ostracism has received considerable empirical attention in the last 15 years, in part because of a revitalized interest in the importance of belonging for human social behavior. I present a temporal model that describes and predicts processes and responses at three stages of reactions to ostracism: (a) reflexive, (b) reflective, and (c) resignation. The reflexive pain response triggers threats to four fundamental needs and directs the individual's attention to reflect on the meaning and importance of the ostracism episode, leading to coping responses that serve to fortify the threatened need(s). Persistent exposure to ostracism over time depletes the resources necessary to motivate the individual to fortify threatened needs, thus leading eventually to resignation, alienation, helplessness, and depression. I conclude with a call for more research, especially on the effects of ostracism on groups, and on possible buffering mechanisms that reduce the long-term negative consequences of ostracism.



1. INTRODUCTION

I'm not afraid of death but I am afraid of dying. Pain can be alleviated by morphine but the pain of social ostracism cannot be taken away.

Derek Jarman, British Film Director (b. 1942)

Ostracism—excluding and ignoring by individuals or groups—appears to occur among all social animals (e.g., lions, buffalo, primates, even bees), and across history in humans, either in primitive tribal groups or modern sophisticated societies. People are ostracized formally within their religions, societies, and institutions (Williams, 2001, 2007a). Individuals are ostracized in close interpersonal friendships and relationships, in the common dyadic tactic called the silent treatment (Sommer et al., 2001; Williams et al., 1998; Zadro et al., 2008a). Despite its prevalence, ostracism is a phenomenon few social psychologists examined before the 1990s. In 1986, Gruter and Masters edited a special issue of *Ethology and Sociobiology* that stemmed from a conference that included “biologists, lawyers, and social scientists for the purpose of taking a fresh and realistic look at the subject of ostracism” (1986, p. iii). In that issue, the editors and authors argued that ostracism evolved as an adaptive behavior that served to strengthen and protect the group from burdensome members. They reported its prevalence among social animals including humans, and documented behavioral, physiological, and neurological correlates of ostracism in a variety of social species. Interestingly, no experimental social psychologists participated in the conference.

Ostracism was regarded as both vitally important and intriguing to many writers. Ralph Ellison wrote in his novel, *Invisible Man* (1952), of his protagonist's exploitation of being invisible as a function of the Black man's ostracism in a white culture. Franz Kafka's sketch entitled, *Gemeinschaft*, immersed us in the absurd predicament of five men excluding a sixth for no apparent reason (even to themselves) other than he was not one of the five (reprinted in Rehbinder, 1986). Joel Chandler Harris (1948) as Uncle Remus, wrote of the frustration, then aggression, resulting from Brer Rabbit's encounter with the Tar Baby, who of course (because he was made of tar), made no response to Brer Rabbit's friendly initiations or his subsequently more urgent entreaties. John Steinbeck (1945/1987) wrote, in *Cannery Row*,

Socially, Mack and the boys were beyond the pale. Sam Malloy didn't speak to them as they went by the boiler. They drew into themselves and no one could foresee how they would come out of the cloud. For there are two possible reactions to social ostracism – either a man emerges determined to be better, purer, and kindlier or he goes bad, challenges the world and does even worse things. This last is by far the commonest reaction to stigma. (pp. 250–251).

Indeed, as early as 1890, William James wrote, when defining the social self,

A man's Social Self is the recognition which he gets from his mates. We are not only gregarious animals, liking to be in sight of our fellows, but we have an innate propensity to get ourselves noticed, and noticed favorably, by our kind. No more fiendish punishment could be devised, were such a thing physically possible, than that one should be turned loose in society and remain absolutely unnoticed by all the members thereof. If no one turned round when we entered, answered when we spoke, or minded what we did, but if every person we met "cut us dead," and acted as if we were nonexistent things, a kind of rage and impotent despair would ere long well up in us, from which the cruelest bodily tortures would be a relief; for these would make us feel that, however bad might be our plight, we had not sunk to such a depth as to be unworthy of attention at all.

(James, 1890, p. 293–294).

It is not that social psychologists felt that ostracism, or the potential of ostracism, was unimportant to their understanding of human social behavior. Indeed, reading between the lines of many classic theories and studies in social psychology, it is relatively easy to spot the omnipresence of the fear of ostracism. Schachter (1951) documented that during group discussions, opinion deviates were first subjected to a barrage of persuasive attempts, and if unmoved, were condemned to expulsion from the group. Why do we conform if not to prevent rejection and exclusion by others? Why do we comply with requests that we would not ordinarily consider on our own? Why do we obey others even when asked to engage in behaviors that go

against our own values? What keeps us from responding to an emergency? What motivates us to change our attitudes when subjected to persuasive attempts by others? Certainly other factors beyond the fear of ostracism contribute to and intensify these effects, but it appears to be at the very core of many of these effects. Sherif (1966), as though directed by Ellison's observation, understood an implication of ostracism (i.e., being invisible) when he chose to dress as a custodian during the Robber's Cave experiment. By doing so, he knew that the children would regard him, because of his role status, as unworthy of attention and would not censor themselves in his presence, allowing him to observe directly what they were doing and saying. Social psychologists understood, at least implicitly, that the fear of ostracism was a social glue that motivated individuals to be responsive to social norms.

There were also a few isolated (yet, quite clever) studies published in social psychology on rejection and being ignored, although these studies seemed to have had negligible influence on the field. These include groundbreaking studies by Craighead et al. (1979), Dittes (1959), Fenigstein (1979), Jackson and Saltzstein (1957), Geller et al. (1974), and Snoek (1962). The findings of these studies illustrated that being ignored or rejected was an unpleasant experience that caused the ostracized individual to dislike the ostracizers. Snoek in particular provided some initial evidence that ostracized individuals might be motivated to seek out assurance from others and that they might, through attributional work, reduce the consequential impact of ostracism. I could add to this list my lone attempt in the 1980s to examine the impact of ostracism on the desire to be alone, remain in the same group, or join a new group (Predmore & Williams, 1986). All of these studies represented interesting beginnings with no follow through.

Zeitgeist for ostracism, social exclusion, and rejection. It was not until the mid-1990s that a consensus of interest on ostracism and related topics (e.g., rejection, exclusion) began. Not coincidentally, this was the same time that the very influential article, *The Need to Belong*, was published by Baumeister and Leary (1995). In this article, the authors spoke persuasively that belonging was a need; that without a connection with at least a few important others, individuals suffered physically and psychologically. Combined with Leary and his colleagues' work on sociometer theory that redefined self-esteem as a mechanism by which one assessed one's inclusionary status (Leary et al., 1995; and later, Leary et al., 1998), there emerged a *Zeitgeist* for research on ostracism. Today, social psychology no longer ignores ignoring or excludes exclusion. Already, there are several books (Leary, 2001; Williams, 2001; Williams et al., 2005), an *Annual Review* article (Williams, 2007a), a soon-to-be-published meta-analysis on the topic (Gerber & Wheeler, in press) and theoretical extensions to other domains (e.g., discrimination, stigmatization) derived from work on social exclusion (Kerr & Levine, 2008; Smart Richman & Leary, 2009). Additionally, new theory and research on *social pain* is directly derived from research on ostracism and related concepts (Chen et al., 2008;

Eisenberger & Lieberman, 2004, 2005; MacDonald & Jensen-Campbell, in press; MacDonald & Leary, 2005).

1.1. Overview

In this chapter, I will put forth a new temporal model of ostracism's effects on individuals, and review the pertinent empirical literature as it relates to the model. This model is based on a model I put forth in 1997 (Williams, 1997), but has undergone significant change that is responsive to subsequent studies and data. As the comparative literature suggested, there appears to be strong converging evidence that the act of ostracism is an evolutionarily adaptive group behavior. For animals lower on the phylogenetic scale, a hard-wired response to ostracize burdensome, dangerous, unpredictable members of the group ensures the groups strength and survival. The impact on the ostracized animal, unfortunately, was certain death. Left without means for reciprocity of comfort, security, food, shelter, and protection, that individual was easy prey for predators. Thus, tendencies to ostracize burdensome members were selected for, making this strategy common across all social animals.

Detection of ostracism co-evolved in individuals to facilitate avoidance of likely death. As such, ostracism and its detection are embedded in our social fabric and permeate our perceptions, feelings, thoughts, and behaviors. I propose a model of ostracism that incorporates ostracism detection, a reflexive pain signal, threatened fundamental needs, reflexive coping responses that serve to fortify the threatened need(s), and cognitive, affective, and behavioral responses. I will also use qualitative data based on interviews and anecdotes to speak to the long-term effects of ostracism on the individual, arguing that the capacity to cope and fortify needs diminishes over time, leaving the perpetually ostracized individual resigned, helpless, alienated, and depressed. I will summarize the research from my and others' laboratories that provide support or counter-evidence to the model, and will then discuss gaps in the research that still need to be addressed.



2. OSTRACISM IS DETECTED QUICKLY AND CRUELY

As can be seen from a depiction of my new model (modified from Williams, 1997) of ostracism in Fig. 6.1, the first step in the ostracism process is that the individual detects ostracism. I use the term detect to distance it from some elaborate cognitive process. Based on an evolutionary perspective, I believe that early detection of ostracism is adaptive; it allows the individual to either correct his or her behavior or to search for alternative groups before the isolating and harmful effects of ostracism take over. First, to detect quickly we would expect to see experimental evidence in

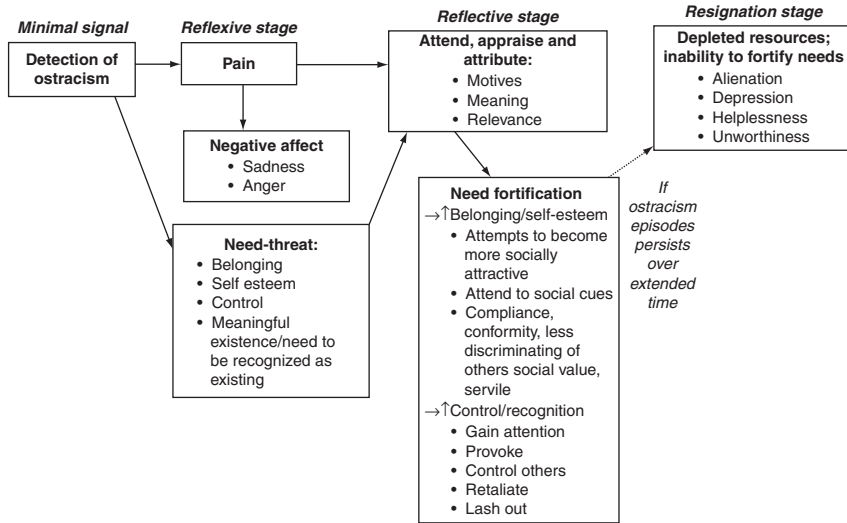


Figure 6.1 New model of ostracism.

which individuals are quick to detect the most rudimentary forms of ostracism. Second, over-detection of ostracism is likely. That is, there ought to be an over-detection bias, perceiving ostracism when it is not actually occurring, because the cost of a false alarm is lower than the cost of a miss. This is consistent with error management theory (Haselton & Buss, 2000; Haselton & Nettle, 2006), which argues that evolutionarily adaptive responses often are geared toward biased detection that least threatens the survival of the individual. Thus, we should be able to document that the detection (and associated pain, as I will discuss next) is rapid and occurs even when, logically and rationally, it should not. Finally, this quick and crude assumption, if not done deliberately and thoughtfully, should be something that signals the individual in such a way that will direct his or her attention to the possible ostracism episode for further analysis and consideration. This signal, I (and others) argue, is pain. The pain, detected at least in the dorsal anterior cingulate cortex (dACC), serves to focus and direct the individual's attention to the source and meaning of the ostracism, so that the individual can determine if the ostracism is potentially threatening and important. Thus, the pain triggers attention and subsequent appraisal.

2.1. Detecting ostracism requires only the slightest representation of ostracism

There are many paradigms to study ostracism, rejection, and exclusion. These include some very blatant manipulations such as those used by Gaertner et al. (2008), Twenge et al. (2001, 2003), and Leary and

colleagues (2006; Nezlek et al., 1997). Gaertner and Iuzinni use a group situation in which one participant is called out in a loud and vicious manner by the others in the group (all confederates) as someone they do not want to have in their group. Twenge, Baumeister, and colleagues give participants a battery of personality tests accompanied by accurate feedback of their level of extraversion, along with bogus feedback that, in the case of exclusion, informs participant that they will be alone without any solid relationships by the time they reach the age of 25. Leary informs participants, after they engaged in a brief get-acquainted session with other members of a newly formed group, that no one else wanted to work with them in the subsequent task. All of these paradigms are interesting and useful in the understanding of how people cope with rejection and exclusion, but they offer little information for ostracism detection. What is needed to examine ostracism detection are paradigms that are subtle, distal, and ambiguous. If such manipulations have similar effects to the more blatant ones, we can conclude that detection is quick, if not crude.

Sitting in a waiting room with two other ostensible participants, a ball toss game emerges. The group is minimal. They do not know each other and have no group task assigned to them. They do not converse. Their only connection is an implied consensus to toss a ball between them. After the actual participants receive the ball a few times, they never get it again. The other two continue to play, looking only at each other. Note there is no explicit rejection, no explicit declaration of not liking or not wanting to include the participant. Things are a bit ambiguous, but what is not ambiguous is that no matter what, the participant is not thrown the ball any more. This paradigm, used by Williams and Sommer (1997; also Warburton et al., 2006; Williams et al., 2002) and depicted in Fig. 6.2, results in strong detection (effect size between 1.0 and 2.0) of being ignored and excluded, along with negative affect and perceptions of need threat (to be discussed in Sect. 3). The same pattern can be observed in conversation paradigms (from unpublished honors theses, reported in Williams, 2001; Zadro et al., 2004; see Fig. 6.2) in which, for no apparent reason (or with a



Figure 6.2 Ball toss paradigm (left) and Train Ride conversation paradigm (right).

reason), during a group discussion two of the participants suddenly begin talking only to each other and do not make any eye or verbal contact with the participant. Ostracism is detected strongly, and without regard to whether or not the participant is in agreement or disagreement with the others, or if the others begin talking about something completely off-topic. Likewise, strong detection emerges in chat room paradigms, regardless of topic or level of agreement with the others (Williams et al., 2002), and in cell phone texting (also known as SMS), when the interaction of the two others is not seen nor heard, nor does it matter if the participant is an in- or outgroup member of the other two texters. Thus, from these paradigms, we can conclude that declarations of rejection and expulsion are not necessary to detect ostracism. Further, it is not necessary to see or hear directly active inclusion taking place among the others in the group. Finally, attributions that ought to assist the detection of ostracism (like disagreeing with the others, being in an outgroup) have no impact on the detection.

All of the preceding paradigms do involve verbal or nonverbal interactions with others. What if we were to begin stripping away these opportunities? Are they necessary for the detection of ostracism? Apparently not. Along with Chris Cheung and Wilma Choi, I developed Cyberball (Williams et al., 2000; Williams & Jarvis, 2006), a virtual ball toss paradigm in which participants, alone with their computers, are led to believe they are playing an incidental game of virtual ball toss as a means to exercise their mental visualization abilities. They are told quite explicitly that the game itself is not important, but rather, they are to use the game to engage their visualizations: what do the others look like, where are they? What is the temperature and weather, if outdoors? What does the geography look like? And on and on. They have not met the others, nor do they expect to meet them. They see animated icons on a screen, depicting the ball tosses (see Fig. 6.3).

In this paradigm, exclusion and ignoring are more distal than in face-to-face paradigms, or in paradigms that permit verbal or nonverbal interaction. Perhaps most importantly, participants are protected from the others by being in a room, alone with the computer. Nevertheless, this paradigm

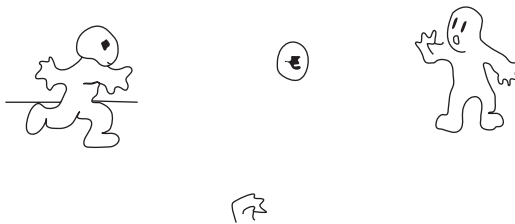


Figure 6.3 A depiction of 3-person Cyberball (participant is represented by the hand figure at the bottom).

yields effect sizes for detection, need threat, and mood impairment similar to that found in the face-to-face ball-tossing paradigm (effect sizes typically above 1.0). Despite believing that the game is irrelevant except to exercise their mental visualization abilities, being left out of a ball toss game represented by animated icons is detected easily and is quite upsetting.

To push the envelope further, Zadro et al. (2004) led half their participants to believe they were playing with other humans, whereas the other half were simply told they were playing with computer generated characters and that there were no others involved in the game. Regardless of whether they were led to believe they were playing with humans or a computer, their detection of ostracism was just as strong, their needs were just as threatened, and their moods just as bad.

Similar detection of being excluded and ignored occurs when participants are led to believe that receiving the ball costs them money (so, being ostracized yields the participant more cash to take with them from the experiment; van Beest & Williams, 2006) or when the virtual players are tossing around a bomb rather than a ball (van Beest, et al., 2008).

One interesting aspect of this research is that even when eye-contact is not possible, (as in chat rooms, cell phone texting, and Cyberball), the manipulations still evoke strong detection of being ignored. Early research by Williams et al. (1998) indicated that the most prominent behavior that signaled ostracism and the silent treatment was lack of eye contact. Apparently, perception of ignoring is more than simply not being looked at or spoken to.

Tracking people's feelings, a proxy for detection, across time in Cyberball allows us to see how quickly ostracism is detected. Participants are trained to dial their feelings second-by-second by being exposed to various mood-inducing photographs. Once trained so they can dial while engaging in another task (in this case, Cyberball), participants show that within 20 s of not receiving the ball, their mood begins to drop precipitously (see Fig. 6.4).

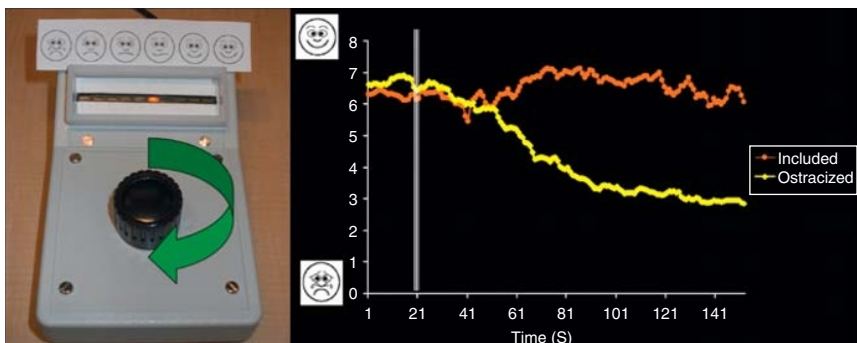


Figure 6.4 The feelings dial (left) and the speed of detecting ostracism in the Cyberball paradigm (right).

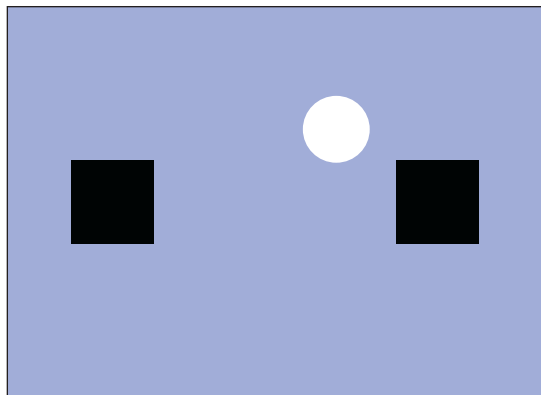


Figure 6.5 Graphic depiction of “minimal world,” sufficient to cause detection of ostracism if participants are encouraged to generate a story describing what they see.

More recently, and as yet unpublished, Alvin Law and I have minimized the ball-tossing paradigm further in search for the minimal conditions necessary to detect ostracism. In one paradigm, we simply tell participants to watch a computer monitor that will show some animation, and when the sphere increases in size, they are to press the “a” key or the “l” key (with no further instructions as to what those keys mean). What they see, depicted in Fig. 6.5, is two square shapes side by side, and a sphere that moves between them or that moves to the center and increases in size. When asked to watch, press keys when necessary, and develop a story that can describe what they are seeing, they report being excluded and ignored, along with negative consequences to needs and mood. The stories that are generated almost always include other people or other animals. Of note is that if participants are not encouraged to generate a story, they report no exclusion or ignoring. Thus, it appears that the stimuli alone are not sufficient to engender feelings of ostracism, but rather it is necessary for individuals to have some general representation that involve others having agency.

Finally, a new paradigm just developed by Jim Wirth and colleagues involves having a participant look at a computer screen (Wirth et al., 2008). They see a human face in which the eyes change direction from looking forward, to looking to the right or left (depicted in Fig. 6.6). Asked to imagine having a conversation with this person, detection of being excluded and ignored directly maps onto the proportion of time the eyes look forward; the more the eyes look away, the more the participant detects (and feels the effects of) ostracism.

The net result of these more subtle paradigms is an accumulation of converging evidence that ostracism in minimal forms is detected strongly and quickly. At least within 20 s of its onset in a minimized version of real-world ostracism, individuals detect its presence and respond negatively.



Figure 6.6 Eye-gaze paradigm.

2.2. Over-detection of ostracism is likely

As Haselton and Buss argue, evolutionarily adaptive responses often involve an error bias that is self-serving. In the case of detecting ostracism, it would be less harmful to detect ostracism when it was not occurring (a false alarm) than to not detect ostracism when it was occurring (a miss). Missing the cues for ostracism, for many social animals, would mean a certain death. For humans, it means expulsion from individuals and groups who are potentially important and nurturing, leading to psychological and physical impairment (Baumeister & Leary, 1995). As I have already alluded, individuals are quick to detect ostracism even in its most minimal forms. As shown in several of the studies mentioned, rational or logical characteristics of the ostracism episode do not appear to moderate the detection (or pain, as discussed below) of ostracism. This implies that factors that ought to indicate the experience is not a meaningful episode of ostracism are ignored or not processed, leading to false alarm errors. Thus, individuals detect and are negatively affected by ostracism by computers (Zadro et al., 2004), ostracism by outgroup members as much as ingroup members—even when those outgroup members are despised members of the KKK (Gonsalkorale & Williams, 2007), not getting the ball when it actually improves one's monetary situation (van Beest & Williams, 2006), and *not* being thrown a virtual bomb that can detonate at any time (akin to not being asked to join in on a game of Russian Roulette!).

Another study showed that even when individuals were told in advance that the other players could not yet throw them the ball because the participant's computer was not yet hooked up to the network, they nevertheless showed signs of detection and displeasure (Eisenberger et al., 2003). Recently, we found that simply watching another person who was ostracized in a game of Cyberball was enough to trigger detection and negative self-feelings in the participant (Bagg, 2008; see also Coyne et al., 2008). Finally, whereas a great deal of previous research documents that sharing the impact with co-targets is sufficient to reduce or diffuse the impact (Latané,

1981), recent work indicates that sharing the ostracism with another co-player does not reduce the negative impact of ostracism (Schefskes, 2008).

As a whole, these studies indicate that factors that ordinarily (and logically) ought to reduce the negative impact of aversive situations are apparently overlooked or underprocessed when it comes to ostracism. If we can generalize this to real-world events, this would suggest an over-detection and over-reaction to events that appear to be ostracism, but are not. Of course, this error management pattern is adaptive in that, as stated earlier, it is better to detect first, and ask questions later. The effort needed to engage in attributional work that can ultimately assist in discounting an apparent ostracism episode is negligible compared to the effort needed to cope with unanticipated ostracism and its negative consequences.

2.3. Ostracism signals pain

The final argument for the initial reflexive response to ostracism is that, from an evolutionary standpoint, something that threatens survival ought to send a strong signal such that the individual can attend to the episode that precipitated the signal and respond. Pain can trigger an immediate response. It can serve to orient the individual's attention to the ostracism episode for further appraisal. The appraisal can tell the individual whether the episode is meaningful or not, and if so, whether other mitigating factors should be taken into account so that proper action, and not an over-reaction, can occur.

Measures of pain by self-reports. We have assessed pain in various ways, mostly using self-report measures that indicate distress, threatened fundamental needs, and worsened moods. These latter constructs are discussed more fully in Sect. 3. More recently, we have provided a pain slide to participants to indicate the level of pain they are currently experiencing, or we give them a question that more directly asks how much pain they are feeling. Although only one study has been published using the pain slide as it pertained to past and current feelings when recalling betrayal (Chen et al., 2008), a subset of those betrayals that were independently assessed as episodes of ostracism indicated high levels of pain associated with these ostracism events (as reported feeling during the event, and again, while recalling it). Our findings regarding the pain slide as currently used indicate a high correlation between the pain slide and the other distress indicators, supporting our view that these self-reports are a reasonable proxy for pain assessment.

Detect first—ask questions later. Using these self-report measures of pain, we find that there are strong (again, effect sizes often over 1.0) painful responses reported during the experience of ostracism, as manipulated by Cyberball, ball-tossing, conversations, chat rooms, and cell phone texting. We find no systematic differences between paradigms. It should be noted

that we typically ask participants to report on their experience during the social interaction. It is this retrospective index of distress or pain that proves to be exceptionally impervious to other situational factors and to individual differences. If ostracism is so threatening that an ostracism-detection system evolved that worked quickly and relatively automatically, then it makes sense that the alarm should go off with clarity and strength, regardless of outside factors and dispositional characteristics of the individual. Consistent with the “detect first—ask questions later” system, the pain gets the attention of the individual so that further reflection and appraisal can take place.

Measures of activation of the dACC as a proxy for pain. Using the Cyberball paradigm in a within-S design while participants lay prone in an MRI chamber, Eisenberger et al. (2003) assessed pain through specific brain region activation using fMRI technology. They also used retrospective self-report measures of distress. When participants first arrived, they were told they would be engaging in a mental visualization task and their brains would be monitored to see what happened during visualizations. The task was Cyberball and was presented with the usual instructions. There were several stages during the experiment, including baseline, inclusion, exclusion because the computer was not yet hooked up with the other players’ computers, and ostracism. Following the fMRI monitoring, the participants filled out a questionnaire asking them about their experience and feelings during the Cyberball game. The dACC is a region of the brain that serves many functions, and is activated for many reasons. It experiences activation for surprise, expectation violation, and pain detection. In the exclusion because of equipment condition, they were expecting to be excluded, whereas in the ostracism condition they were not expecting exclusion. Nevertheless, significant dACC activation was observed for both episodes of Cyberball ostracism. This suggests that the activation was not simply because of expectation violation, but might also be the result of pain detection. Our post-experimental questionnaire supported the pain explanation: self-reported distress correlated 0.88 with dACC activation. This study was replicated in a nonscientific media broadcast by the BBC with only a few participants. The results further corroborate the self-report assessments and provide support for the argument that ostracism, even in a minimal situation and whether or not it is expected, is detected immediately as pain.

A recent study by Zhong and Leonardelli (2008) demonstrates that participants assigned to the ostracism condition in Cyberball feel, relative to their inclusion counterparts, cold. They are even more likely to request something warm to ingest. Although not pain, feeling cold is another unpleasant embodiment of pain, thus lending further support to this hypothesis.

A final piece of evidence comes from work by Jacqueline Nadel and colleagues (2007) on the use of “still face” with autistic children. These

autistic children, who ordinarily give no eye contact with the adult and no signs of affection, are temporarily at least transformed into being responsive, affectionate, and attention-seeking simply by being in the presence of an adult adopting a “still face.” The still face approximates a mannequin-like expression that is completely unresponsive to the child. How does this support a pain explanation. Years ago, Ivar Lovaas used a cattle-prod on autistic children who were engaged in self- or other-harmful behaviors. Quite unexpectedly, the shocked child became attentive and affectionate, much like Nadel’s children. It appears as though the appearance of ostracism in the form of still face produces similar effects to the pain of a shock.

In addition to signaling pain, I argue that ostracism has a deeper psychological impact on individuals. A shock of pain, without any further damage, is unlikely to do much more than encourage the individual to avoid the shocking object. But, much more happens to an individual’s psychological equilibrium after ostracism.



3. OSTRACISM THREATENS FOUR FUNDAMENTAL NEEDS, REDUCES POSITIVE AFFECT, AND INCREASES NEGATIVE AFFECT

According to the model, ostracism is an interpersonally aversive behavior unique in that, compared to physical or verbal altercations, it can threaten four fundamental needs: the need to belong (Adler, 1930/1970; Baumeister & Leary, 1995), the need to maintain a reasonably high self-esteem (Steele, 1988; Tesser, 1988), the need to perceive control over one’s social environment (Burger, 1992; Peterson et al., 1993; Seligman, 1975), and the need to feel recognized for existing and being worthy of attention (Greenberg et al., 1986, 1990, 1992). The term *need* as applied to these four constructs can be debated; are they needs or motives? As Baumeister and Leary cogently argue (1995) a need, if thwarted, is directly linked to harmful physical and psychological outcomes. There appears to be enough evidence in the literature that not maintaining satisfactory levels of any of these four constructs results in psychological harm. Regarding physical well-being, belonging (Baumeister & Leary, 1995) and control (Langer & Rodin, 1976; Seligman, 1975) are associated with health problems and even mortality, and because self-esteem and lack of meaning are associated with depression, and depression is linked with physical illness (Allen & Badcock, 2003; Myoshi, 2001), it does not seem unreasonable to suggest that each of these four constructs are needs.

Perhaps a more contentious issue is whether or not these four needs are independent constructs. At this point in time, the evidence is murky and contentious. Advocates of each need tend to view the other constructs as

being subsumed by theirs (e.g., see Leary et al., 1995, on how self-esteem is subsumed by belonging; or Greenberg et al., 1992, on how self-esteem is merely a buffer to instantiate meaningful existence). It is neither my intention nor aim to settle this matter, as it seems to me that there is adequate evidence that all four need constructs exist logically and psychologically (including their measurement). It seems reasonable to conclude that they overlap to some degree but are conceptually separable. So, feeling a loss of belonging can lower self-esteem, which can lower a sense of meaningfulness and feelings of efficacy. This sentence can probably be rewritten changing the order of each of these four needs and make sense. Rather than arguing which need holds supreme, I will present my reasons why ostracism can affect each.

Why belonging? Being ostracized by others is a signal of a divorce between self and others. One no longer is connected to the group or to the other individual. The ostracized individual is not attended to, looked at, or considered. By its very definition, the individual is excluded. There is substantial agreement that ostracism (rejection, social exclusion) thwarts belonging (Twenge, Baumeister, Leary, Gaertner, Pickett, Gardner, to name a few).

Why self-esteem? Ostracism involves silence. Its employment, unless done formally by nations or institutions, is usually abrupt and comes with no explanation. This leaves the ostracized individual to generate reasons for their treatment. When left to ruminate, ostracized individuals may conjure up many possible explanations why others are ignoring and excluding them. When considering self-attributions for ostracism, thoughts of self-blame, inappropriate behavior, meanness, selfishness, etc. will be considered. Compare this to a verbal argument in which the cause of disagreement is articulated. There is no need to generate more reasons than the one given. Because the reason is often withheld, targets of ostracism are forced to consider a laundry list of bad things they have done or said. Surveying this list, I argue, will drive self-esteem down further than having to consider only one (or a few) accusations.

Why control? Unlike a verbal or physical disagreement, the ostracized individual lacks any ability to engage the source of the ostracism. Ostracism is unilateral; one cannot argue, discuss, or reason with the ostracizers because they do not respond. In a verbal argument the accosted individual can direct the flow of the argument to some extent, changing arguments, making accusations of the other, escalate or deflate the anger. In a physical altercation the individual can duck, run, or hit back. But there is no efficacious response to ostracism. The individual might as well argue with a brick wall.

Why meaningful existence/need for recognition? Being ostracized, it has been argued (Case & Williams, 2004) is a metaphor for death. Others have suggested death is a metaphor for ostracism (A. Aron, personal

communication, 2006). Either way, being ignored and excluded is like being invisible, like not existing, like being dead. In many tribes that use ostracism, the term translates to social death. James, in his quote, referred to it as “cutting them dead.” In this sense, ostracism ought to be a mortality cue, a palpable reminder of what life would be like if they were dead. Verbal and physical arguments do not have this existential threat quality. The individual is real, is being argued with or hit; these are reminders of existence, not nonexistence.

Ostracism reduces positive affect and increases negative affect. Being subjected to ostracism is a negative experience, so it is not surprising that it should be distressing affectively in addition to threatening fundamental needs. As most reactions to pain, negative affect should increase, including anxiety, sadness, and anger, and positive affect should decrease. These effects are routinely found in most ostracism, social exclusion, and rejection paradigms (see Williams, 2007a, for a review). There is some controversy, however, and it is worthy to note that for some studies, affect is not altered. It appears as though studies that employ paradigms that leave the participant without any cognitive or behavioral recourse for re-inclusion (like the life-alone paradigm), affective numbness seems to occur more often than negative affect (Twenge et al., 2003). In many of our and others' studies, emotional assessment is not sufficiently thorough, so it remains to be seen whether other emotions are activated during or after ostracism. Researchers should consider assessing fear, anxiety, shame, guilt, and others.

3.1. Experimental evidence for ostracism-induced need threat

Self-report measures. We have used self-report measures aimed at assessing manipulation checks of belonging and being ignored, need satisfaction (the inverse of which is interpreted as need threat) levels for belonging, self-esteem, control, and meaningful existence, and negative affect in the form of sadness and anger. The current scale in use is shown in Table 6.1. This is a theory-derived measure aimed at assessing perceptions of inclusion and being ignored, levels of satisfaction in the needs, and mood. It is not a validated diagnostic scale. Our analyses indicate that there is high correspondence between the items within each need, four factors that fit nicely with the four needs, but we also see a moderate correlation between all four need satisfaction scales. Often, when not testing a specific need's impact on subsequent measures, we create a need satisfaction index, combining all four needs. When measured, almost all studies in our lab or others' labs show significant reductions in satisfaction to the four needs (Williams, 2007a,b). Thus, in face-to-face ball tossing (Williams & Sommer, 1997), Internet chat rooms (Williams et al., 2002), SMS cell phone texting (Smith & Williams, 2004), role play paradigms (Zadro et al., 2005), event-contingent diary studies (Nezlek et al., 2004), out-of-the-loop paradigms (Jones et al., in press);

Table 6.1 Assessment of manipulations, need satisfaction, and mood following ostracism

For each question, please circle the number to the right that best represents the feelings you were experiencing during the game					
	Not at all				Extremely
Belonging					
I felt “disconnected” (R)	1	2	3	4	5
I felt rejected (R)	1	2	3	4	5
I felt like an outsider (R)	1	2	3	4	5
I felt I belonged to the group	1	2	3	4	5
I felt the other players interacted with me a lot	1	2	3	4	5
Self-esteem					
I felt good about myself	1	2	3	4	5
My self-esteem was high	1	2	3	4	5
I felt liked	1	2	3	4	5
I felt insecure (R)	1	2	3	4	5
I felt satisfied	1	2	3	4	5
Meaningful existence					
I felt invisible (R)	1	2	3	4	5
I felt meaningless (R)	1	2	3	4	5
I felt nonexistent (R)	1	2	3	4	5
I felt Important	1	2	3	4	5
I felt useful	1	2	3	4	5
Control					
I felt powerful	1	2	3	4	5
I felt I had control over the course of the game	1	2	3	4	5
I felt I had the ability to significantly alter events	1	2	3	4	5
I felt I was unable to Influence the action of others (R)	1	2	3	4	5
I felt the other players decided everything (R)	1	2	3	4	5
Mood					
Good	1	2	3	4	5
Bad	1	2	3	4	5
Friendly	1	2	3	4	5
Unfriendly	1	2	3	4	5
Angry	1	2	3	4	5
Pleasant	1	2	3	4	5
Happy	1	2	3	4	5
Sad	1	2	3	4	5

(continued)

Table 6.1 (continued)

For each question, please circle the number to the right that best represents the feelings you were experiencing during the game	Not at all				Extremely
Manipulation check					
For the next three questions, please circle the number to the right (or fill in the blank) that best represents the thoughts you had during the game					
I was ignored	1	2	3	4	5
I was excluded	1	2	3	4	5
Assuming that the ball should be thrown to each person equally (33% if three people; 25% if four people), what percentage of the throws did you receive?	—%				

and Cyberball paradigms (Carter-Sowell et al., 2008; Eisenberger et al., 2003; Lakin et al., 2008; Williams et al., 2000; Zadro et al., 2004), there is ample evidence that ostracism, compared to inclusion, results in less belonging, lower self-esteem, less control, and a sense of meaninglessness and invisibility.

Further support for a threat to meaningful existence has been demonstrated in a recent study that found that ostracized participants reported lower scores on a life is meaningful scale. This is noteworthy in that the scale requests of participants their world views of life's meaning, not their current feeling. Anecdotally, we have observed several participants in the ball-tossing experiments pinching themselves while being ostracized, an indication that they are testing for their existence.

Our effect sizes for our measures of reflexive need threat (the inverse of need satisfaction) are routinely large; between 1.0 and 2.0. At one point, we figured it took three participants per cell (that is, three ostracized and three included) to obtain for these measures a *p* value less than 0.05. The effects extend beyond college students. Cyberball has been used to examine the impact of ostracism on children (Zadro et al., 2008b), adolescence (Sebastian et al., 2008) and a representative sample of male and female African American and European American adults in the US from age 18–82 (Goodwin et al., 2007). For every population tested, a 2–3 min episode of ostracism reliably threatens needs and increases negative affect.

Converging evidence for need-threat is also provided by studies that, either by inference or tested mediation, show outcomes that are predicted by a need-threat assumption. That is, when a need is initially thwarted,

organisms will engage in mental or behavioral activities that serve to fortify the needs. If, for example, control is deprived, then individuals will react against that control deprivation and attempt to regain control (Pittman & D'Agostino, 1989; Pittman & Pittman, 1980; Wortman & Brehm, 1975). Thus, in Sect. 4, I will lay out the assumptions behind the reflective stage and review the research that pertains to need fortification. In the following sections, I consider the effects of long-term or persistent ostracism. Using the control deprivation example again, research has determined that if control fortification fails, over time, helplessness will result, in which organisms show resignation, even if control is achievable (Seligman, 1975; Wortman & Brehm, 1975).



4. REFLECTION AND RECOVERY: RECOVERING FROM NEED THREAT DIRECTS NEED FORTIFYING THOUGHTS AND ACTIONS

Once individuals detect ostracism, feel the pain, negative affect, and threatened needs, what then? Because their attention is directed to the ostracism experience, they are in a position to assess, appraise, and attribute the meaning and importance of the ostracism episode. According to the need-fortification hypothesis, they will feel, think, and behave in ways that will reestablish optimal levels of the need or needs that were most saliently threatened. It is in this stage that attributions, based upon situational context and individual differences, are hypothesized to play an important role in the speed of psychological recovery and behavioral options used for coping with threatened needs.

Let us first examine evidence on speed of recovery from a brief ostracism episode.

4.1. Speed of recovery

Without distraction. As mentioned earlier in this chapter, Jim Wirth, Eric Wesselmann, and I have developed an online feeling measure to assess the onset, slope, and recovery of negative affect from ostracism. Participants dial their level of negative or positive affect, and we record their dial setting automatically every second. With no instruction or intervening task, but with the Cyberball task completed, participants continue to dial their affect over time. Using this as one gauge of recovery, we find that without debriefing or distraction, participants began to recover within a few seconds, and recovered to the level of inclusion within a minute. This is not surprising. First, Cyberball is an admittedly mild form of ostracism; the participant has never met, nor intends to meet the other players, and they

are engaged in a minimal form of computer mediated interaction. Second, these participants have nothing to do but monitor their feelings following their Cyberball experience, so they are able to cognitively and affectively cope with what just happened unabated by distracting tasks. Other evidence suggests longer recovery rates for participants when other tasks intercede.

With distraction. Zadro et al. (2006) had participants (half in the normal range and half high in social anxiety) play Cyberball and fill out immediately after the need satisfaction and mood measures. The participants were then given several tasks to work on for the next 45 min. At the end of that time they were once again asked to answer about their current need satisfaction and mood. The authors found that both low and high social anxiety participants experienced distress as indicated by the measure asking them how they felt during the game (the immediate or reflexive stage). After the 45-min work period, those in the normal range of social anxiety had recovered completely to the levels of participants who were in the inclusion condition. Those who were high in social anxiety, however, were only half-way to full recovery.

Recovery moderated by individual differences. Oaten et al. (2008) conducted a similar study with normal to high social anxiety participants, but examined their abilities to self-regulate following inclusion or ostracism. In the first study, self-regulation involved not being tempted by eating too much non-nutritious food; in the second study, self-regulation was measured by willingness to drink a foul-tasting, but supposedly nutritious drink. In both studies, they found that the individual differences in social anxiety had no impact on initial levels of self-regulation, and that following ostracism, all participants were less able to self-regulate than had they been included. Forty-five minutes later, however, only those who were high in social anxiety continued to show problems with self-regulation. Another study found individual differences in subsequent retaliative responses to rejection, finding that participants scoring higher in rejection sensitivity were more likely to allocated hot sauce to the perpetrator of rejection (Ayduk et al., 2007).

Recovery moderated by situational context. Gonsalkorale and Williams (2007) examined whether ostracism by despised others would be less aversive, or perhaps even positively valenced event. After all, should not we want to be excluded and ignored by people we hate? In their study, we convinced Australian students that they were participating in a cross-national study that involved other individuals from diverse groups. This allowed a convincing cover story that resulted in participants believing that they were playing Cyberball with individuals who shared their own political leanings, had political leanings of the opposing party, or who represented the upstart KKK of Australia. Pretesting indicated that participants liked best others who shared their political leanings, were unfavorable to those espousing the opposing party, but absolutely despised members of the KKK of

Australia. They then played Cyberball with two other individuals who were from one of these three groups (Labour, Liberal, or KKK). Relying only on immediate measures of distress, we found that, regardless of the group membership of the other players, ostracism was strongly and similarly distressing, indicating once again the unwillingness or inability of individuals to incorporate contextual information in their immediate responses to ostracism.

But what if we had given participants some time to recover, to get beyond the initial pain, negative affect, and need threat? In a follow-up to this research, Gonsalkorale et al. (2008) replicated the basic aspects of the study with African American students at Howard University. Immediate responses to ostracism, despite the fact that African Americans are the targets of hate by the KKK, still reacted no more negatively to ostracism by the KKK as they did to ostracism by Republicans or Democrats. More importantly, we assessed their negative affect and need threat a second time after the passage of several minutes. Here, we see recovery moderated by the situational context. Recovery was more complete for those ostracized by the KKK than by the opposition party (e.g., Republicans), and being ostracized by the opposition party allowed fuller recover than being ostracized by members of their own party (e.g., Democrats). These results suggest that, whereas immediate responses are not moderated by context, recovery and coping processes take context into account.

There are many situational contexts that can potentially speed or hinder the recovery process. In addition to the KKK studies, group membership of the ostracizers has been examined in other experiments (Goodwin et al., 2007; Wirth & Williams, in press), which show recovery is quicker and fuller when ostracized by outgroup members.

Other situational factors that inform perceived motives should similarly affect whether the individual can dismiss the ostracism episodes, or worry about them. In my original model (Williams, 1997), I suggested that an ostracism episode could be attributed to several motives, each carrying more weight. Often, individuals consider a brief instance as ostracism ("he didn't say 'hi' back!") when they find out that the other person had not heard ("oh, he's listening to his iPod"). Thus, *mistaken episodes* of ostracism ought to cause only temporary distress until the mistake is discovered. Often, *norms* of society dictate civil ostracism, as when elevator riders are not attended to by other riders. Although elevator riders were briefly offput (as measured by mood as soon as they stepped off the elevator) by another rider not acknowledging their existence with the typical eye gaze and nod, it is likely they recovered quickly (Zuckerman et al., 1983). Sometimes, people engage in ostracism to avoid aversive consequences themselves. We may not speak to someone because we anticipate their wrath; we may ostracize because if we do not, we risk being ostracized ourselves. This occurs with employees at corporations when a whistle-blower returns to work;

best friends of the whistle-blower will join the other and *defensively ostracize* for fear that the other employees will freeze them out, too (Faulkner, 1998). In many instances, of course, ostracism is perceived (and intended) as punitive, and this should be more difficult to slough off as being unimportant or inconsequential. Finally, a rather pernicious form of ostracism, *oblivious ostracism*, occurs when an individual (or group) is simply unworthy of attention. They are so low on the pecking order that they are not seen nor heard by others. This occurs in caste systems as well as in everyday instances where status and power are particularly salient. When individuals attribute ostracism to this motive, not only do they feel the sting of ostracism, but also needs of existence and recognition ought to be so threatened that recovery may take the longest. More research is needed to determine the recovery rate as a function of the attributed ostracism motive.

Hence, social anxiety, an individual difference that filters and selectively attends to socially ambiguous or aversive events, and situational context in the form of the social identity of the ostracizers, both play a role in recovery from ostracism. Presumably, those high in social anxiety could not easily discount the ostracism episode as meaningless, and instead, probably ruminated about why they were ostracized and what they may have done to bring on such treatment. And, those finding themselves ostracized by a despised outgroup could more easily discount and recover from the pain and distress. Those ostracized by ingroup members continued to be distressed.

The role of distraction and rumination. Swim and Williams (2008) tested more directly the role of rumination on recovery from ostracism. Participants played Cyberball and were either included or ostracized. Following reporting their need satisfaction levels and mood, half the participants were instructed to watch and write about four change blindness slides, an engaging and distracting task that prevents rumination. The other half of the participants were encouraged to ruminate, to write down their thoughts about what they were thinking “right now.” As expected, the content of the online writing was infused with thoughts about the Cyberball experience, particularly for those who were ostracized. They then reported their levels of need satisfaction and mood again. Those who were prevented from ruminating had recovered from the aversive experience of ostracism, whereas those who were encouraged to ruminate remained in psychological distress.

4.2. Need fortification

According to the need-fortification hypothesis, ostracized individuals (compared to those who were included), should feel, think, and act in ways that will fortify the most saliently threatened need(s). For example, if belonging is highly threatened, ostracized individuals should have a higher desire for

belonging, should have thoughts and perceptions of social connections, and should behave in ways that elevate their chances for belonging. The same can be said for self-esteem, control, and meaningful existence.

Inclusionary need cluster: Belonging and self-esteem. To the extent that self-esteem can be understood as a sociometer of social inclusion (Leary et al., 1995), the constructs of belonging and self-esteem become intertwined. Thus, in this section, and because ostracism and rejection research has not yet disentangled self-esteem from belonging, I suggest that thoughts, feelings, perceptions, and behaviors aimed at fortifying belonging also elevate self-esteem. Belonging and self-esteem, then, become an inclusionary need cluster, such that fortification serves the purpose of increasing the likelihood that the individual feels connected, or can become connected to others.

Power and provocation need cluster: Control and existence. In a similar vein, it is operationally difficult to separate desires to exert control from desires to be noticed and thought worthy of attention. An act of exerting control or being especially provocative fortifies both needs. Thus, I will review research evidence for these two needs as they represent a singular cluster of power and provocation. When these needs rise to the top of individuals' priorities, they may be less concerned for being liked and fitting in than they are in dominating others and forcing others to recognize their existence. Thus, we may be more likely to expect antisocial and aggressive acts.

4.3. The inclusionary cluster: Belonging and self-esteem fortification

Several studies in ours' and others' labs have provided converging evidence that following ostracism (or rejection), individuals behave in ways to reestablish their inclusionary status. That is, they do things to either remind themselves of their social connections, or that will improve their chances of belonging. Thus, we would expect to see evidence of increased social attentiveness that would aid the individual in discerning cues that could enable social connectivity. Further, there ought to be evidence that, if given an opportunity, ostracized individuals should do things that would make them fit in and be more attractive to others. Ostracized individuals should therefore try harder to fit in and be liked, even to the point of becoming socially servile and susceptible to social influence.

Social attentiveness. According to research by Gardner, Pickett, and colleagues, and similar to Leary et al.'s sociometer theory, humans possess a social monitoring system that signals when the individual's inclusionary status is at risk. Once signaled, the social monitoring system motivates the individual to monitor and attend cues that others emit to enhance inclusion possibilities (and to avoid rejection possibilities). The first step in this process is to be hypersensitive and attentive to social information. Consistent with this hypothesis, individuals who scored higher in the need to belong, or in

loneliness, were more likely to show improvements on memory for social information (Gardner et al., 2000). Those higher in belonging also have been shown to be more sensitive to nonverbal cues (Pickett et al., 2004).

More recent research suggests a bias in favor of social attention to potentially accepting individuals. For instance, participants who were asked to recall an instance when they were rejected were better able to discriminate accurately between nongenuine (or deceptive) smiles and genuine (Duchenne) smiles (Bernstein et al., 2008). In a related study, ostracism improved individuals' ability to detect between-category variability (i.e., between sad and happy) in relevant social stimuli at the expense of within-category variability (i.e., variations within happy) (Sacco et al., 2008). Similarly, excluded participants were fast at spotting smiling faces in a crowd, fixed their attention more on smiling faces in an eye tracking task, and persisted longer in attending to smiling faces (DeWall et al., in press).

4.4. Social servility

Social servility refers to an individual's proclivity to be overly concerned with fitting in and being liked to the point of being especially malleable and obsequious.

Nonconscious mimicry. Increasing one's attraction to others can be done consciously and nonconsciously. One nonconscious behavior is to increase one's mimicry of another. In a very clever set of studies, participants were ostracized or included (via Cyberball) and then met with another person (a confederate who displayed various behavioral mannerisms) for an interview. Ostracized participants were more likely to mimic these mannerisms, especially when the other person was an ingroup member (Lakin et al., 2008).

Working harder for the team. Typically, people engage in social loafing when they are working on a collective task in which their individual contributions are pooled (Karau & Williams, 1993). After being ostracized (compared to included) in the waiting room ball toss game, female participants (but not males) were more likely to do the opposite: to work harder when working collectively than when working individually on an idea generation task. Presumably, female participants were more concerned to do well and improve their inclusionary status when combining their efforts with those who ostracized them, than were females who were individually accountable for their efforts (Williams & Sommer, 1997). This finding was replicated recently, although the authors argued that social status rather than gender alone may account for the sex differences (Bozin & Yoder, 2008).

Compliance. Another way to be liked is to be more compliant, to agree to costly and possibly unwanted requests. Following a game of Cyberball in which they were either included or ostracized, participants were led to a waiting room for an ostensible second phase of the experiment. Waiting in the room was a participant (actually, a confederate) who had just arrived and

had not participated in the Cyberball game. When the experimenter left the waiting room, the confederate told the participant that she was a Purdue band member and was collecting pledges for a fund raiser. Using either a direct request, the foot-in-the-door tactic or the door-in-the-face tactic, the confederate requested a pledge from the participant. Regardless of tactic used, ostracized participants were more likely to make a pledge, and pledged more money than included participants (Carter-Sowell et al., 2008).

Behavioral extraversion. Will ostracized individuals be more outgoing, more open to possible relationships, and actively search for others with whom to connect or groups to join? In one study, following Cyberball inclusion or ostracism, participants were asked to evaluate a randomly drawn videotape of a new student organization. Regardless of whether the new student group espoused laudable goals such as improving resume writing and interviewing skills for students looking for employment, or more questionable goals of using the mind to bend spoons and walk through walls, ostracized participants liked the group spokesman and his group better (Wheaton, 2001). When asked to evaluate potential dates, ostracized males reported a greater desire to affiliate romantically and platonically than included males. Moreover, ostracized males also reported consistently enhanced perceptions of their own desirability (both platonic and romantic). Ostracized females, however, did not report an elevated desire to affiliate platonically or romantically when compared to included females, nor did they view themselves to be any more desirable. This pattern of results is consistent with evolutionary explanations of differential mate selection pressures between the sexes (Winton et al., 2008). In another set of six studies, participants were threatened with social exclusion expressed greater interest in making friends, to work with others, to form more positive impressions, and to reward new interaction partners. These effects were not observed if the others were the perpetrators of the exclusion (Maner et al., 2007).

4.5. Power and provocation cluster: Control and existence fortification

Several studies provide evidence for control fortification. In two studies reported by Lawson Williams and Williams (1998) and Williams (2005). In Study 1, male students at the University of Toledo (OH) were either ostracized or included in the waiting room with the face-to-face ball-tossing game, and were led to believe the other two individuals were either strangers to each other or friends with each other (in either case, the participants did not know the confederates). Based on pretesting that indicates people feel less in control when in the presence of two people who are friends with each other, it was hypothesized that those ostracized by a friendship-pair would feel the strongest control threat. Following the

ball tossing, a fourth participant (also a confederate) showed up and the participant was paired with this newcomer in a “facial communication” study. Participants were asked to guess on several trials the color of the playing card at which the newcomer was looking. Participants were told they could request that the newcomer look left, look right, or look straight ahead as often as they wished to help them make the guess. The more requests of the newcomer to shift his face were our measure of exerting control. Consistent with our prediction, it was only the participants who were ostracized by the friendship-pair who exerted significantly more (in fact, twice as much) control over a newly arriving naive participant. In Study 2 with Australian female students, waiting participants played the emergent face-to-face ball toss game with two strangers or two females who were friends with each other. They were then given Burger’s (1992) desire to control scale. The same pattern of results emerged; only those participants who were ostracized by friendship-pairs reported a higher desire for control.

Control fortification and aggression. Further support for control fortification was found by Warburton et al. (2006) who examined aggression following ostracism. As Tedeschi (2001) argues, aggression is a behavior that reestablishes power and control. Under the guise of an experiment examining cross-modality perception, participants first found themselves in the waiting room and playing the face-to-face toss game. Half were included and half were ostracized. Once the “actual experiment” began, they were told they had to listen to 10 noise blasts of a highly irritating sound. Half were told they could control the onset of each noise blast (control restoration) whereas the other half were subjected to an unpredictable sequence of the noise blasts (control deprivation). In the next phase of the experiment, with a rigged drawing, they were assigned the task of doling out a portion of food for the ostensible food perception phase of the study (rather than being assigned the role of taster). They could give as little or as much of the food as they wished to a naive participant, who had to eat the entire amount, and whose food preferences had been assessed. All participants found out the food (again, determined by a rigged drawing) was hot sauce, and that the naive participant strongly disliked hot sauce. Thus, control fortification was assessed by the amount of hot sauce the participant allocated. Hot sauce allocation is used by aggression researchers; the more hot sauce allocated, the more aggressive the act (Lieberman et al., 1999). The results of this study support the control (via aggression) fortification hypothesis. Only the ostracized control-deprived participants showed significantly higher levels of aggression, allocating nearly five times as much hot sauce as did participants in the other three conditions.

Other studies have examined factors that moderate the ostracism/rejection → aggression link. One study found that when a highly entitative group socially rejects individuals and the individuals have an opportunity to retaliate, they are more likely to do so than if the group is less entitative (Gaertner et al., 2008). These results are consistent with the Williams and

Lawson Williams study mentioned earlier when individuals were ostracized by friendship-pairs; one feels less control when rejected by a tight-knit group than a mere collection of individuals. Another study found that induced anger, but not sadness, led to greater aggression following ostracism. Additionally, when anger was manipulated by unfair ostracism (in Cyberball), participants were more aggressive than if the ostracism was perceived as more fair (Chow et al., 2008). If schemas of fairness are violated, it may be that the predictive and explanatory control offered by such schemas are undermined, leading to a desire to control through aggression.

Life-alone and blind-sided rejection paradigms increase aggression. Research that uses control-threatening exclusion paradigms also supports the ostracism → control → aggression link. Twenge and her colleagues (Twenge et al., 2001, 2007) have used two exclusion paradigms that, by themselves, increase the likelihood of aggression. Compared to the ostracism paradigms used in our lab, these paradigms seem to be especially highly threatening to control. In the life-alone paradigm, participants are led to believe that their personality test scores indicate that by the time they reach the age of 25, they will no longer be able to maintain close relationships, and will live out their lives alone. Clearly, if believed, participants in these studies are left little recourse to do or imagine ways in which they could reestablish social connections. Because their future aloneness is inevitable, any control they have to establish close social connections has been stripped away. Thus, aggression and the control it provides becomes the behavior of choice.

Another paradigm that yields aggressive reactions is the get-acquainted paradigm (Nezlek et al., 1997; Twenge et al., 2001). In this paradigm, participants meet together in groups and are told to get acquainted. They are given some topics (e.g., favorite movies, home towns) to talk about, and they enjoy a friendly group discussion. They are then separated into individual cubicles, asked who of the group they would like to work with and then experimenter takes the information to form groups. When the experimenter returns, participants hear that either everyone or no one wants to work with them. When given the rejection information, participants were more likely to be aggressive toward members of the group or naive others. At first, this direct rejection → aggression finding was puzzling. In thinking about the phenomenology of the participants in this paradigm, however, we guessed that they were generally finding themselves in a positive and friendly group interaction. So, to hear that no one likes you should be quite an unexpected jolt. Their sociometers, their gauges of inclusionary status, must have been giving them hopeful feedback, and yet they are blindsided by the unanimous rejection. We think they felt let down by their sociometers; their gauges of inclusionary status were either unreliable or broken. This realization, we reasoned, threatens explanatory and predictive control (Skinner, 1996). An excessive loss of control is not as obvious in this paradigm, so we conducted an experiment in which we replicated the

conditions of these other studies, with a twist. Participants had their discussion among a group of confederate students. The confederates were trained to be attentive, responsive, and friendly, or uninterested and dismissing when the participant spoke. Thus, half were led to expect rejection whereas the others expected acceptance. This manipulation was crossed with the feedback that all or none of the group members wanted to work with them. Participants were then taken to a new experimental room and asked to take part in a food taste test (similar to the hot sauce paradigm described earlier). Aggression was significantly higher when rejected participants were blindsided by the group vote than when they were led to expect rejection (Wesselmann et al., 2007). Thus, it appears that control deprivation plays a crucial role in the ostracism → aggression sequence.

As yet, no studies have specifically set out to test whether ostracized individuals are more likely to attempt to fortify self-esteem or meaningful existence. Anecdotally, one of the five participants in a week-long role play study (i.e., *the scarlet letter*), expressed no concern for being liked when subjected to hours of ostracism by his peers, but felt jubilant when his repeated attempts to catch their attention met with success.

Gerber and Wheeler (in press) conducted a meta-analysis of the ostracism, exclusion, and rejection literature and focused on evaluating the evidence for behavioral indicators of need threat. They found strongest support for behavioral indicators of threats to belonging and control, with little or no direct support for behavioral indicators of threats to self-esteem or meaningful existence/need for recognition.

Clearly, experimental evidence is needed to test these hypotheses, but real-world events like school shootings and shooting sprees seem to combine a feeling of being ostracized or marginalized from peers or society, with a motivation to be noticed and remembered, and if not respected or feared (Leary et al., 2003). As Dennis Lynn Rader, the BTK (bind, torture, and kill) Killer from Wichita, Kansas wrote, “how many do I have to kill before I get some national attention?” (Chu, 2005).



5. RESIGNATION: LONG-TERM EFFECTS OF PERSISTENT OSTRACISM

Some individuals are ostracized for long periods of time, by the same individual or group, or by any number of different sources. The closest we can get to this stage, empirically, might be examining the life-alone paradigm that Twenge, Baumeister, DeWall and colleagues use (Baumeister & DeWall, 2005; Baumeister et al., 2002, 2006; Twenge et al., 2001; 2003, 2007). Within a short laboratory session, participants are convinced that they will lead a life alone; that by the age of 25, they will no longer have

successful relationships, and that if they ever marry, their marriages will not last. To the extent that participants believe this prognosis, they are, in a sense, experiencing an anticipated long-term period of social ostracism and disconnection from others. How do these participants respond that speaks to these long-term effects?

The first striking difference between the results of these studies and those using more temporary methods of ostracism (e.g., ball-tossing, Cyberball, group rejection) is that negative affect appears to be missing. Participants become affectively numbed, or as Baumeister and Twenge describe it, cognitively deconstructed (Baumeister et al., 2006). Baumeister, in his analysis of people attempting suicide, finds a similar pattern of cognitive deconstruction prior to the suicide attempt (Baumeister, 1990). In essence, if emotions are for action, affective numbness is a signal of passivity, of giving up, of psychological paralysis. Thus, these studies provide some evidence for, rather than fighting or fortifying, helplessness and submission.

The second pattern these researchers find is a lack of self-regulation (Baumeister et al., 2006) following the life-alone feedback. To the extent that need fortification can be viewed as a form of self-regulation, a costly yet functional goal, then we could regard this temporary long-term response of impaired self-regulation as another form of unwillingness to try, to work, to fortify.

Other than these empirical investigations using the life-alone feedback, research on the long-term effects of ostracism are, at this point, mostly based on qualitative research, interviews, letters, and anecdotes. As such, these accounts provide a rich collection of examples and insights that can speak to, if not test, the third stage of the temporal model of ostracism.

Lisa Zadro, as part of her dissertation, interviewed over 50 individuals who had experienced long-term ostracism (Zadro, 2004). These individuals responded to newspaper and magazine ads asking those with experiences with long-term ostracism or the silent treatment to come to our laboratory for an hour interview. About two-thirds of the individuals were subjected to long-term ostracism whereas the other third had subjected others to long-term ostracism.

The third stage of the temporal model, called resignation, suggests that the resources necessary for fortifying threatened needs become, over time, depleted. Like reactance turns to learned helplessness (Wortman & Brehm, 1975), belonging fortification should turn to detachment and alienation, self-esteem maintenance should turn to depression, and attempts to prove worthy of attention should turn to passivity and a sense of worthlessness.

How does persistent ostracism affect individuals, who despite early attempts at fortifying their needs, are subjected to weeks, months, and years of being invisible to those in their lives? Quotes from our letter writers and interviewees seem to support the resignation hypothesis.

I just sort of go into a little shell and I don't want to talk in case I'm not there . . . I feel as if I'm a ghost.

One young woman had a history of verbal abuse followed by several months of silence from her father. She had sought counseling for depression, and was especially distraught over the realization that the pattern of ostracism would never stop.

I'm 40 years old and my father hasn't talked to me for the last 6 months. Recently, he was in hospital and I was told he might die. I decided I had to go see him, even if he wasn't talking to me. I walked up to him and held his hand and said "Oh Daddy, please don't leave me." He looked at me, his eyes welled up with tears, then turned his head away from me. He still wouldn't talk to me . . . his death would be the final silence.

An elderly woman's husband did not look at her, talk to her, eat with her for the last 40 years of his life (he passed away before we interviewed the wife). When asked why she did not leave her husband, she said she did not think anyone would want her and at least she had a roof over her head.

In many instances, targets of long-term ostracism revealed suicidal ideation or actual suicide attempts. One woman recalled,

In high school, the other students thought me weird and never spoke to me. I tell you in all honesty that at one stage they refused to speak to me for 153 days, not one word at all . . . That was a very low point for me in my life and on the 153rd day, I swallowed 29 Valium pills . . .

Almost all of those interviewed who had been subjected to long-term ostracism mentioned, without prompting, that they would have preferred physical abuse over ostracism (recall the William James' quote earlier suggesting that even torture would be preferred to being cut dead). As one woman said,

. . . My second husband, who was an alcoholic used to physically abuse me, but the bruises and scars healed very quickly and I believe that [the silent treatment] is far more damaging than a black eye . . .

When we finally asked our interviewees why they would have preferred physical abuse we heard two answers. First, they said that then they would at least know that their spouse knew they existed. The second reason dealt with the deaf ear victims of long-term ostracism face when trying to relate their problems to others. A middle-aged woman said, "I can take bruises to the police, but I can't show them the bruises of silence."

A letter from a father who found himself ostracizing his son for several months is enlightening, not only in terms of what the ostracism did to his son, but why and how people choose to ostracize, and why it may become a long-term process.

Not so long ago, I had a row with my son, which was terminated by his use of extremely violent and foul language at me. I was so shocked and outraged by this incident that I instinctively, that is without any thought about what should be my appropriate response, instigated a regimen of ostracism toward him. I did not speak to him, I did not acknowledge anything he said to me, or anyone else, in fact I acted as if he were not even present. I did not set a place for him at the table nor did I provide for him in any meals that I prepared for the family.

As I said, I slipped into this, although for me novel, paradigm without any premeditation and, hence, without any difficulty and maintained it comfortably as if it were the natural way of family relationships. I was able to perpetuate it easily and without any discomfort for myself.

After two weeks, I woke up one morning with a blinding flash of insight: "What are you doing to your relationship with your son?" In that short period my son had already become intimidated by this treatment – he did exactly what his mother said at all times and whenever he spoke it was in a quiet whisper. I am ashamed to say that I was sort of pleased with the effect of my ostracism but, as I say, one day I suddenly realised that it was making him weak and submissive and that it was eroding the future quality of our relationship.

To terminate the ostracism, however, was an extremely difficult process. I could only begin with grudging, monosyllabic responses to his indirect overtures. I was only able to expand on these responses with the passing of time and it is only now, about six weeks since the ostracism ceased that our relationship appears to be getting back to pre-row normality. The pain and stress from a period of ostracism clearly impact on the principals for far longer than the actual period of ostracism.

On your radio program last week, the case was mentioned of a husband who ostracised his wife for 40 years. I suspect that, in that particular case, the longer the ostracism persisted, the harder it became to stop such that there came a point when, no matter how much that husband wanted to speak to his wife, it was just too difficult to do. This is what I felt after just two weeks of ostracism of my son – that if it had lasted much longer I might have not have been able to stop and that not only would our relationship have been destroyed but also my son himself might have been permanently emotionally and physiologically disfigured. Further, as also suggested on the radio program, it may even have led to illness and perhaps, ultimately, to his premature death.

So the point of this letter is just to say that ostracism can be like a whirlpool, or quicksand, if you, the user, don't extract yourself from it as soon as possible, it is likely to become impossible to terminate regardless of the emergence of any subsequent will to do so.

The use of ostracism against one's immediate family might be an instinctive reaction but its effects may be horrific. I have been deeply shocked by the effect of its use in my family and will ensue that it never happens again.

I hope that this anecdote will help to add weight to any thesis that you may be developing such that some good may come from that harrowing experience. [reprinted with permission]

Not only does long-term ostracism debilitate psychological resilience, but once started, appears to be difficult for perpetrators to stop.

More research needs to be done on the effects of long-term ostracism. There are many sectors of society who experience ostracism on a daily, weekly, monthly, and yearly basis. These include the mentally ill, physically challenged, homeless, and to a lesser degree, anyone who is not fulfilling the role that is expected of them, like middle-aged single individuals among their married friends (DePaulo & Morris, 2005; Williams & Nida, 2005) or married students among their single student friends (Carter-Sowell, 2008). What can be done to ameliorate the helplessness and depression that slowly replaces the fight to fortify threatened needs? Often, groups of individuals feel ostracized by the majority. How do groups, in comparison to individuals, respond to ostracism? Both of these issues are discussed briefly in the final section that points to our gaps in the understanding of ostracism.



6. FUTURE RESEARCH: GROUPS, COMMUNICATION, AND ASSISTANCE

Small and large groups, clans, gangs, organizations, and countries are often “not recognized” by society or the rest of the world. It is unfortunately too easy to think of instances of disenfranchised groups who resort to provocative actions and violence to gain attention and fear, if not respect, from the world around them. Yet, our understanding of the effects of ostracized groups is negligible compared to our knowledge of the ostracized individual.

How do groups, compared to individuals, respond to ostracism?

Does sharing the ostracism experience with others in one’s group diffuse the aversive impact of the ostracism? Because individuals in ostracized groups already have a sense of belonging in their group, are they more likely to turn to provocation and violence than are individuals who are ostracized? These are questions that deserve our attention, and we are just beginning to examine them.

According to Latané (1981), bearing the negative impact of outside sources should be diffused or lessened when one shares the impact with others who are co-targets of the same aversive behavior. Like individuals who diffuse responsibility for helping (Latané & Darley, 1970) or for working (Latané et al., 1979), should ostracized individuals feel less pain and less need threat when they share the ostracism with others? Using the

train ride paradigm (Zadro et al., 2005), we recently manipulated whether two sources ostracize one target or two sources ostracize two targets. Behaviorally, we see evidence that when a target of ostracism has a co-target, they turn to that co-target and seem to form a bond by talking and commiserating with each other. They also report less distress. Yet, two experiments using Cyberball, in which we examine individuals or pairs playing the virtual ball toss game with other individuals or pairs, suggest no immediate diffusion of negative affect or need threat (Carter-Sowell et al., 2007; Schefskes et al., 2008). Instead, we observe the same levels of aversive impact and negative affect immediately, but some evidence suggesting faster and better coping in the reflective stages.

The discontinuity effect (Insko, Schopler et al., 1990) describes the findings in group-to-group negotiation and cooperation/competition research that groups are more competitive and aggressive to other groups than individuals are to individuals. We see some evidence of this in our group-to-group ostracism studies, in that groups tend to be more aggressive in their responses to other groups, than are individuals to other individuals.

Taken together, these preliminary results suggest that individuals in groups are not protected from the initial pain of ostracism, but can find comfort and engage in retaliative responses more than lone targets of ostracism. The implication for real-world groups is both optimistic and frightening. Ostracized group members can comfort each other and speed up the coping process, but they might also turn to provocation and violence more easily and quickly than their individual counterparts.

6.1. What can be done to help targets of ostracism?

A call for research

A second domain of research that requires exploration is what can be done to buffer or ease the pain that ostracism inflicts. Given the results of the research to date, we have much more evidence that ostracism hurts than we have evidence for reducing its distressing impact.

The research from the reflexive stage suggests little or nothing can be done to eliminate the initial prick of pain that ostracism elicits. Perhaps this is good, because if we numbed ourselves to this pain, we may not become aware of situations in which our inclusionary status is at risk. Recovery from the pain of these occasional ostracism episodes is relatively quick and, judging from the behavioral evidence for fortification, effective. The real problem exists for those who are making the transition from short to long-term ostracism. Those who endure perpetual ostracism appear to lose their ability or motivation to fortify their threatened needs, and become despondent, alienated, and experience feelings of worthlessness. If any stage of response to ostracism deserves our attention, it should be to help individuals maintain their motivation and effort to resist helplessness.

Individuals who are unable to make the effort to seek connections with real people can even find relief by making parasocial attachments to pets, photographs of friends, and even favorite TV characters (Gardner, Pickett, & Knowles, 2005). Some even suggest that acetaminophen can, over several days, reduce the psychological hurt of ostracism (DeWall et al., 2008). Maybe support groups comprised of ostracized individuals could be formed to provide members with bolstered senses of belonging, self-esteem, control, and meaningful existence.

One goal of this chapter is to call for theory-driven applied research aimed at aiding the plight of ostracized individuals and groups before they pass into a stage of resignation and depression.



7. SUMMARY

Ostracism is a behavior employed by all social animals. Its use strengthens and protects the ostracizers while sending a quick signal to the target that demands attention and possible behavior change. The ostracized individual feels a palpable threat not only in the feeling of pain, but also at four fundamental needs: belonging, self-esteem, control, and meaningful existence/recognition by others. Upon reflection, if the ostracism is considered meaningful and important, it leads the individual to feel, think, and behave in ways that fortify or restrengthen the threatened needs. If belonging and self-esteem are most saliently threatened, then individuals will fortify by increasing their inclusionary status. They will be more open to others, pay more attention to others, conform and comply, generally becoming servile and friendly. If, however, control and meaningful existence/recognition by others is most saliently threatened, the individual will forsake positive impressions by others and will provoke and exert control, even aggressive control, toward others. Finally, if individuals endure ostracism over weeks, months, or years, their resources needed to cope by fortifying their threatened needs will become depleted, and they will enter a stage of resignation, alienation, helplessness, and depression. Future research should examine the impact of ostracism on small and large groups, as well as examine strategies that can prevent the entrance into the resignation stage.

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