View metadata, citation and similar papers at core.ac.uk
brought to you by CORE
provided by IUScholarWorks

IMPLICIT SOCIAL INFLUENCE

Winter Mason

Submitted to the faculty of the University Graduate School
in partial fulfillment of the requirements
for the degree
Doctor of Philosophy
in the Department of Psychological and Brain Sciences
and the Department of Cognitive Science
Indiana University
August 2007

Accepted by the Graduate Faculty, Indiana University, in partial fulfillment of the requirements for the degree of Doctor of Philosophy

Doctoral Committee

Eliot R. Smith, Ph. D.

Robert L. Goldstone, Ph. D.

Zakary Tormala, Ph. D.

Olaf Sporns, Ph. D.

August 9, 2007

First, I would like to thank my parents, Priscilla Campbell and Brian Mason, for continuing to believe in me despite some rough spots and wasted tuition money. In more ways than one hundred, I wouldn't be here without them.

Many thanks to my dissertation committee. Despite a sudden change in topic, they continued to encourage me towards my goals.

Eliot Smith, thank you for listening, gently correcting me when I went astray, and proudly patting me on the back when I did something right. Your sincerity helped me as much as your brilliance. Rob Goldstone, thank you for introducing me to the field that has excited me most, and putting up with my slack moments and manic moments. I imagine one day that will actually pay off! Zak Tormala, thank you for schooling me, not just on attitudes and persuasion, but also on the basketball court. Olaf Sporns, thank you for inspiring me with your modest brilliance, encouraging me in my original dissertation idea, and sticking with me when the topic leapt out of your domain.

I also want to especially thank Sarah Queller, who brought me into the world of social psychology and showed me the good science there.

I would like to thank the members of my lab (past and future): Charlie Seger, Riki Conrey, Elizabeth Collins, Austin Chapman, and Elise Percy Hall, for their helpful questions and comments on the work and the manuscript. A big thanks to Riki for giving it to me straight; her wit and wisdom (and dirt) were often my best counsel. I'd like to give a special thanks to Charlie and Elizabeth for actually reading the whole thing, and for their invaluable feedback. Charlie, even though I won't be around, I'll be happy to return the favor!

I would like to thank my two closest friends in Indiana, Joe Anderson and Eddie Fernandez, for helping me stay focused when I needed to be and well entertained when I didn't. Thanks also to Shawn Alexander, for being a true friend, and for reminding me that what I was doing wasn't really working.

And finally, I want to thank pancakes, for being warm and sweet and keeping me happy every day while writing this dissertation.

Winter Mason

Implicit Social Influence

Previous research has shown that people hold two kinds of attitudes, *explicit attitudes*, which are voluntary evaluations of things, and *implicit attitudes*, which are automatic evaluations that occur spontaneously and are difficult or impossible to control. Prior work has shown that social influence, whether it is intentional persuasion or incidental influence, usually leads the recipient of the influence to change his or her attitudes to be closer to the attitudes of the source of the influence. This work has focused on the effect of the explicit attitudes of the source of influence but ignored the possible effect of the source's implicit attitudes. Three studies examine the independent effect of the source's *implicit attitude* on a recipient in different social influence settings

In the first study, the implicit and explicit attitudes of a source towards a target were measured, and in the second two studies the implicit and explicit attitudes of the source were manipulated. In the first study, the recipient watched the source give a persuasive message about the target, in the second study the source described the target directly to the recipient, and in the third study, the recipient watched the source interacting with the target.

Results revealed that implicit attitudes have an influence on a recipient, but in unexpected ways. In the first study, the sources' implicit attitudes led to a contrast effect on the recipients' explicit attitudes. In the second and third study the

manipulation of the sources' attitudes did not work as expected, and the influence of the sources' implicit attitudes on the recipient was not detected. Thus, a person's implicit attitudes can influence another person's attitudes, but they must be strong and possibly naturally occurring. The conditions in which implicit attitudes lead to influence deserve further research.

Table of Contents

Table of Contents

List of Figures

List of Appendices

Implicit Social Influence

Social influence is a powerful force in human psychology. The knowledge, beliefs, attitudes, opinions, emotions, and behaviors of other people shape the way an individual perceives, understands, and acts on the world. This influence can come in the form of direct persuasion (Petty & Cacioppo, 1996), learning (Deutsch & Gerard, 1955; Kaplan & Miller, 1987), modeling (Bandura, Ross, & Ross, 1963), conformity (Asch, 1951), obedience to authority (Milgram, 1963), unconscious mimicry (Chartrand & Bargh, 1999), peer pressure (Brown, Clasen, & Eicher, 1986), and on and on. When seen from a broader perspective, social influence underlies the very fabric of culture. As people learn new things, develop new styles or fashions, or create new ways of thinking or doing things, it is the force of social influence that causes these developments to eventually permeate a people and then serve as the starting point for future developments. Central to many studies of social influence and a determining factor in the spread or stagnation of culture itself are peoples' attitudes towards the elements of culture – innovations, styles, food, etc. As revealed by the many studies of social influence, typically when there is influence between two people it means that the attitudes of the recipient of social influence are brought closer to the attitudes of the source of influence.

Roughly twenty years ago, research on attitudes demonstrated that people could automatically evaluate stimuli, and that this evaluation was not always the same as the attitude expressed in response to explicit questioning. Since then, there has been a surge of interest in the distinction between implicit and explicit

attitudes. As a result, evidence has accumulated showing that automatic evaluations and deliberative evaluations can be dissociated in how they are shaped, how they change, and how they guide behavior. One implication of this research is that a person's automatic evaluation and deliberative evaluation can influence behavior simultaneously and sometimes incongruently. However, no work to date has shown whether implicit and explicit attitudes can have independent effects on other people. The three studies reported in this manuscript seek to demonstrate that the influences of a person's automatic and deliberative attitudes on another person are also dissociable.

This introduction first introduces the historical struggle to define attitudes, especially the difference between implicit and explicit attitudes, reviews evidence supporting the dissociation of these attitudes in measurement and influence on behavior, reviews work on the influence of nonverbal behaviors on attitudes, and finally ties it all together to show the literature supports the hypothesis that implicit attitudes can have an independent effect on others' attitudes.

What Are Attitudes?

Defining implicit attitudes and how they differ from explicit attitudes is regrettably not as simple as one would like. The meaning of implicit attitudes has been the center of a debate amongst attitude researchers that has brought the very construct of 'attitude' under scrutiny (Gawronski, in press). Therefore, to elaborate on the distinction between implicit and explicit attitudes, it is necessary to briefly review the various definitions of "attitudes" that have been used in the literature.

Thurstone (1928) said an attitude is, “the sum total of a man’s inclinations and feelings, prejudice or bias, preconceived notions, ideas, fears, threats, and convictions about any specified topic.” More recently, Eagly and Chaiken (1993) defined an attitude as “a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor” (Eagly & Chaiken, 1993, p. 1). Revealing the influence of cognitive psychology, Fazio, Chen, McDonel, and Sherman (1982) defined an attitude as an association between an object and an evaluation.

While there are some common elements in these definitions, there is still disagreement about the best way to think of attitudes, including how an attitude is represented in memory (Abelson & Prentice, 1989; E. R. Smith & Conrey, 2007), whether attitudes are necessarily bipolar (Osgood, Suci, & Tannenbaum, 1957) or composed of separable positive and negative components (Cacioppo, Gardner, & Berntson, 1997), whether there are multiple types or bases of attitudes (Breckler, 1984; Zanna & Rempel, 1988), and whether attitudes are enduring dispositions (Ajzen & Fishbein, 1977; Bem, 1970; Cialdini, Petty, & Cacioppo, 1981) or constructed with each elicitation (Schwarz & Bohner, 2001; Wilson & Hodges, 1992). Despite these remaining ambiguities in the definition of attitudes, some of which were precipitated by the struggle to develop a theoretical account of implicit and explicit attitudes, it is possible to extract a general definition that seems well agreed upon: an attitude is an evaluative response to a stimulus.

What Are Implicit Attitudes?

Indirect measurements of attitudes have been in use in social psychology for over half a century (Campbell, 1950). For most of that time, their utility has been to avoid reactivity or self-presentation effects, and the assumption was that the indirect measurements were tapping a cleaner version of the same construct as the direct measurements. However, it was recognized that some evaluations were occurring faster than possible with deliberative thought (Fazio, Sanbonmatsu, Powell, & Kardes, 1986), and that the elicitation of an attitude could occur with the subliminal presentation of a stimulus (Greenwald, Klinger, & Liu, 1989). This led some researchers to hypothesize the existence of *implicit attitudes* (Greenwald & Banaji, 1995), evaluations that could be activated automatically and / or outside of conscious awareness.

This implication, that there were unconscious attitudes that could be different from the conscious attitudes, stirred up theoretical and empirical research on the topic (Fazio, in press), and is still hotly debated. For instance, Schwarz and colleagues (Schwarz, in press; Schwarz & Bohner, 2001) assert that since all attitudes are constructed spontaneously, the empirical evidence for implicit and explicit attitudes is simply the result of different contextually sensitive attitude constructions, rather than evidence for two separate but stable attitude representations. Wilson, Lindsey, and Schooler (2000) suggest that implicit attitudes are well-learned evaluative responses to a stimulus, while explicit attitudes (when they differ) are recently learned responses that have not been practiced sufficiently to become automatic. Fazio and colleagues (Fazio, 1990; Fazio & Towles-Schwen, 1999) argue that there are two distinct processes, one

automatic and one controlled, that lead to differences in the attitude-behavior relation, and thus the differences in implicit and explicit measures. Gawronski and Bodenhausen (2006) suggest that the explicit attitude is contained within a propositional framework (Strack & Deutsch, 2004), so the evaluation of the object can be compared with other beliefs and tested for veracity, whereas the implicit attitude is contained in an associative framework, subject to the underlying structure and rules of pattern activation (McClelland & Rumelhart, 1985; E. R. Smith, 1996; E. R. Smith & Conrey, 2007; E. R. Smith & DeCoster, 2000). For instance, one could implicitly associate good feelings with fatty foods, which is merely an association and has no truth or falsehood to it, whereas the explicit attitude that "fatty foods are good," can be checked and corrected with the knowledge that fatty foods lead to heart disease and obesity, which are bad.

Nevertheless, the general agreement about how to appropriately conceptualize implicit attitudes is reaching consensus. First, as already mentioned, the responses that are elicited with very fast presentation or in situations with little possibility for conscious control can be different than those given when there is the opportunity to reflect. This is most strongly and reliably evident in the different responses to implicit and explicit attitude measures. Second, there is evidence that different sources of influence affect implicit and explicit attitudes differentially. Third, and finally, implicit and explicit attitudes seem to guide different kinds of behavior in different contexts.

In the following three sections, this introduction reviews the history and development of implicit attitude measures, and especially how they differ from

explicit attitude measures, then describes research showing that implicit and explicit attitudes can be influenced by different sources, and reviews work showing that implicit and explicit attitudes can have different effects on behavior, concluding that implicit and explicit attitudes are indeed dissociable.

Measurements of Implicit Attitudes

In 1928, Thurstone's manuscript, "Attitudes Can Be Measured," marked the beginning of an era in attitudes research. Thurstone developed a scale that respondents could use to indicate their preference, and argued that the responses on this scale were an adequate indicator of the person's underlying attitude. Likert (1932) and Osgood et al. (1957) developed similar scales. All of these were not much different than opinion surveys that simply and straightforwardly asked participants to state their preference with respect to the attitude object. The research that accompanied the creation and testing of these scales showed that there was a reliable correlation between the expressed attitude and the person's behavior towards the attitude object. However, this correspondence did not always exist (LaPiere, 1934; Wicker, 1969), which Thurstone recognized but attributed to, at best, self-presentation concerns, and at worst, plain dishonesty.

Thus, it was apparent that it was desirable to develop indirect measures of attitudes, to avoid the problems with self-report. As mentioned, most of the early indirect measures of attitudes were designed to circumvent these self-presentation and honesty concerns, such as the now-famous "bogus pipeline," (Jones & Sigall, 1971) in which participants were persuaded to believe they were attached to what was essentially a lie detector to encourage fidelity in the responses. Jones and

Sigall focused their method on socially sensitive issues, specifically attitudes towards minority groups. However, even when responses could safely be assumed to be honest, they still did not always correspond with later behavior.

Taking the lead from memory researchers who distinguished between automatic and controlled processes (Schneider & Shiffrin, 1977), Fazio et al. (1986) reasoned that if object-evaluation associations were stored in memory, their recall could also be dissociated into automatic and controlled processes. Indeed, they showed that priming with positive and negative words (i.e., cockroach or puppy) led to facilitation on the categorization of the valence of words that were also positive or negative. Devine (1989) brought the effect into the domain of racial attitudes, and showed that unconscious priming of a stereotype could lead participants to utilize the stereotype in subsequent information processing. Advances in technology allowed researchers to subliminally present pictures rather than words, and thus was born one standard measure of automatic attitudes, affective priming (Fazio, Jackson, Dunton, & Williams, 1995). Fazio and colleagues interpreted the facilitation in categorization caused by primes to be a valid and reliable measure of person's attitude, although they tried to remain agnostic as to whether it was tapping a person's "true" attitude by leaving a question mark at the end of the article's title, "Variability in automatic activation as an unobtrusive measure of racial attitudes: A bona fide pipeline?"

Nonetheless, the question sparked a veritable watershed in research on measures of automatic attitudes (Dovidio, Kawakami, Johnson, Johnson, &

Howard, 1997; Greenwald, McGhee, & Schwartz, 1998; Nosek, 2001; Payne, Cheng, Govorun, & Stewart, 2005; von Hippel, Sekaquaptewa, & Vargas, 1997). Most prominent is the Implicit Association Task (IAT; Greenwald et al., 1998), which compares the facilitation (or inhibition) when the same response is required for categorizing target stimuli (e.g., African-American faces) and positively valenced words to the facilitation (or inhibition) when the same response is required for target stimuli and negative words. If the target category is strongly associated with positivity or negativity relative to a contrast category, there will be a large difference in facilitation (or inhibition) between the two response-pairings. Greenwald and colleagues (1998) firmly asserted that the processes leading to responses on the IAT were highly efficient, uncontrollable, and unconscious, and therefore fully automatic.

Another measure, the Affect Misattribution Paradigm (Payne et al., 2005) uses the affect elicited by a stimulus in an indirect measure of attitudes. This procedure relies on the affect misattribution effect in which a person is uncertain of the source of affect and erroneously attributes the cause to something else within awareness (Dutton & Aron, 1974; Murphy & Zajonc, 1993). In this procedure, exemplars from a target category (e.g. Republicans) and a foil category (e.g., trees) are briefly presented prior to a Chinese ideogram, and participants are told to ignore the prime and evaluate the ideogram. Even if they are explicitly told to correct for the bias of the prime, participants under-correct and attribute some of the affect elicited by the prime to the ideogram. Thus, ideograms that follow the target category will tend to be categorized more positively if the target

category elicits positive affect. Payne et al. (2005) describe their measure as an implicit measure, but the authors remained agnostic about the automaticity of the processes that led to responses on the measure.

Bargh (1994) outlined four criteria for a process to be automatic, what he called the "Four Horsemen of Automaticity": 1) increased efficiency, 2) lack of control, 3) lack of intention, and 4) lack of awareness. It was clear that responses on explicit measures did not have any of these qualities: the responses required controlled, intentional deliberation within the subject's awareness. It was much less clear whether the processes that led to responses in the implicit attitude measures, such as facilitation in affective priming, met these four criteria. It is safe to say that the responses were highly efficient, since facilitation occurs very rapidly. The evidence also indicated that the responses were uncontrollable and unintentional (Kim, 2003; Payne et al., 2005). However, the evidence that the responses were unconscious was mixed, at best (Bargh & Pietromonaco, 1982; Devine, 1989; Winkielman, Berridge, & Wilbarger, 2005), and was certainly not a requirement for the differential responses on explicit and implicit measures of attitudes. Indeed, after Greenwald and Banaji (1995) postulated a separate, unconscious attitude, it became increasingly unclear whether the "implicit" in the term, "implicit attitude measure" was meant to apply to the measure (participants were unaware that their attitude was being measured), or to the attitude (participants were unaware of their attitude).

Thus, although there is still disagreement as to whether implicit attitudes are *necessarily* unconscious – and the evidence appears to point towards the negative

– there are clearly times a person is unaware of their automatic attitude (Bargh & Pietromonaco, 1982). It does, however, seem safe to say that implicit attitudes meet the other three criteria for automaticity as defined by Bargh (1994). As mentioned, this is in contrast to explicit attitudes (as measured by traditional "pencil and paper" questionnaires), which meet none of these criteria. Of course, this does not mean that explicit and implicit attitudes cannot be the same; in fact, for many attitude objects they are highly correlated (see Nosek, 2007). However, it does mean that they *can* be different, both in how they are elicited and the contexts in which they arise.

Implicit and Explicit Attitudes Are Influenced by Different Sources

Not only are the attitudes dissociable in the attitude measures, there is evidence that the implicit and explicit attitudes can be influenced independently as well. For instance, some research shows that implicit attitudes can be changed with no effect on explicit attitudes. Lowery, Hardin, and Sinclair (2001) found that the mere presence of an African-American experimenter affected White participants' responses on a Black-White IAT without affecting their responses on explicit measures such as the Modern Racism Scale (McConahay, Hardee, & Batts, 1981), the Internal and External Motivation to Respond Without Prejudice scales (Plant & Devine, 1998), or the Social Dominance Orientation scale (Pratto, Sidanius, Stallworth, & Malle, 1994).

In another similar study, Dasgupta and Greenwald (2001) showed that repeated exposure to admired Black persons and disliked White persons reduced automatic prejudice as measured by an IAT without affecting responses on feeling

thermometers or semantic differential scales. Similarly, Sinclair and colleagues (Sinclair, Lowery, Hardin, & Colangelo, 2005) showed that participants' (negative) automatic attitudes towards Blacks was attenuated when interacting with an experimenter wearing a t-shirt that proclaimed anti-racism ideals. Presumably, participants' affiliative goals led them to "socially tune" their automatic, implicit attitudes to the expressed attitudes of the experimenter.

Using a very different methodology, Olson and Fazio (2006) showed that evaluative conditioning could influence participant's implicit attitudes without affecting explicit attitudes. The participants in the experimental condition saw photographs of Black people repeatedly paired with positively valenced words, while the control participants saw the same photographs and words, but the two were not consistently paired together. On a subsequent measure of implicit attitudes, participants in the experimental condition showed a decreased association between Blacks and negative words compared to the control condition. There was no difference between conditions on the explicit ratings of prejudice.

Other research showed a change in explicit measures with no change in the implicit. Gawronski and Strack (2004) showed that cognitive dissonance reduction changed explicit attitudes but had no effect on implicit attitudes (see also Schooler, 1990). Using a standard cognitive dissonance induction procedure, they had participants write a counter-attitudinal essay in either a low or high situational pressure condition. In the low situational pressure condition, attributing one's behavior to external causes was much harder than the other, high

situational pressure condition. Relative to the control condition and the high-pressure condition, the low-pressure condition caused the explicit attitude to change in the direction of the essay, but did not affect the implicit attitude, thereby reducing the correlation between implicit and explicit attitudes.

In work by Gregg, Seibt, and Banaji (2006), participants learned about two novel groups, such that one was always described as positive and the other was always described as negative, which was sufficient to induce congruent explicit and implicit attitudes toward the novel groups. In their third experiment, some of the participants were told that there was a mix-up, and the descriptors of one group were supposed to be applied to the other group, and then asked them to complete the attitude measures again. In this study, the explicit attitude reversed (in accord with instructions), but the implicit attitude did not reverse, thereby inducing conflicting implicit and explicit attitudes in the participants.

Most importantly, still other work showed that both attitudes could be simultaneously affected in opposite directions. Deutsch and Strack (2002; as reported in Strack & Deutsch, 2004) had participants repeatedly choose between a red or blue "door" that had different consequences. One door led to a fast presentation of a very negative photograph, followed by a long presentation of a pleasant photograph. The other door had a fast presentation of a positive photograph and a long presentation of a negative photograph. When given time to choose between the doors, participants consistently chose the door that had the long presentation of a pleasant photograph. However, when under extreme time pressure, the choice reversed. Thus, the briefly presented photograph influenced

participants' automatic evaluations of the doors, but the more persistent photograph influenced participants' explicit attitudes.

Using more conventional measures of implicit and explicit attitudes, Rydell, McConnell, Mackie, and Strain (2006) simultaneously conditioned participants through subliminal priming to have one implicit attitude while training them through a categorization procedure to have the opposite explicit attitude about a person. Later measurements of the attitudes using explicit questionnaires and the IAT (Greenwald et al., 1998) revealed the participants' implicit attitudes had been influenced by the primes while their explicit attitudes had been influenced by the categorization procedure, resulting in incongruent implicit and explicit attitudes.

All of these examples show that explicit and implicit attitudes can be manipulated independently. This implies that either the attitudes are represented independently or that the automatic and controlled processes that lead to differential evaluative responses are independent. In either case, there appears to be strong evidence that not only can implicit and explicit attitudes be elicited and measured with different methods, but they can be changed by different means as well.

Different Effects of Implicit and Explicit Attitudes on Behavior

Most important to the research at hand, however, is whether (and how) implicit and explicit attitudes differentially guide behavior. Clearly, because the responses on attitude measures are themselves behaviors, there are at least some contexts in which implicit and explicit attitudes have dissociable effects on behavior. However, it is useful to delineate the contexts in which these attitudes

influence behavior, what behaviors are guided by automatic or controlled evaluations, and whether they can simultaneously influence behavior (when the attitudes are dissociated).

Thirty years ago, Icek Ajzen and Martin Fishbein presented a summary of research on the attitude-behavior relationship, beginning by noting that, "Reports of rather low or nonsignificant relations between attitudinal predictors and behavioral criteria have been accumulating for more than 40 years," (Ajzen & Fishbein, 1977, p. 1). However, they went on to outline the conditions under which there was a correspondence between attitudes and behavior. This work came before the implicit / explicit distinction, and indeed, the attitude measures they focused on would be considered explicit. In their review, they suggested that the reason explicit measures sometimes failed to capture subsequent behavior was because the measure was aimed at a different behavior than the one being predicted. For instance, an explicit attitude measure might show a positive evaluation towards birth control, but then poorly predict future use. However, if the measure instead focused on attitudes towards personally using birth control in high arousal situations, the favorability might drop considerably and the attitude-behavior correlation might correspondingly increase.

Early research on attitude-behavior consistency showed that the more a person engaged in reflective processing, both when considering their attitudes (Carver & Scheier, 1978; Snyder & Swann, 1976) and when engaging in the behavior (F. J. Smith, 1977; but see Wilson & Schooler, 1991), the higher the correspondence between the measured attitude and the behavior. This supports the hypothesis that

explicit attitudes guide behavior when there is opportunity for deliberation (Fazio et al., 1982).

Conversely, those behaviors that are automatic and relatively uncontrollable tend to be guided by implicit attitudes. This includes speeded reactions (Strack & Deutsch, 2004) and behaviors that are normally spontaneous, such as nonverbal behaviors. Chen and Bargh (1999), replicating a study by Solarz (1960) found that participants were faster at pushing a lever away from themselves when presented with a negative stimulus and pulling it towards themselves in response to a positive stimulus than the opposite motor movements. The speeded reactions required in the task indicate that the automatic evaluations were influencing their reaction times for the different behaviors.

In a more real world example, Fazio et al. (1995) tested the predictive validity of the affective priming procedure, in which a Black experimenter rated the friendliness of her interaction with participants, paying special attention to nonverbal behaviors. The experimenter's rating was significantly correlated with the facilitation scores from the implicit attitude measure, but was not related to the participants' scores on the MRS (McConahay et al., 1981), an explicit attitude measure.

Dovidio and colleagues (Dovidio, Gaertner, Kawakami, & Hodson, 2002; Dovidio, Kawakami, & Gaertner, 2002) also found that a priming measure correlated with the participants' nonverbal friendliness towards a Black confederate, as measured by the confederates themselves, judges' ratings of the videotaped interaction, and judges' ratings of the participants' nonverbal

behavior. However, their verbal friendliness correlated with the explicit measure of racial attitudes, and with the participants' rating of their own friendliness.

This mimicked results from a previous study that measured nonverbal behaviors more carefully. Dovidio et al. (1997) measured participants' implicit racial attitudes using an affective priming procedure, and measured their explicit attitudes using the MRS and the Old-Fashioned Racism scale (ORS; McConahay et al., 1981). They then had participants interact with a Black and White interviewer, which they video recorded. They found that explicit attitudes, as measured by the MRS and ORS, predicted participants' explicit ratings of the interviewers, such that higher scores on the explicit scales led to lower liking of the Black relative to the White experimenter. The explicit scales did not, however, predict the participants' nonverbal behaviors. Instead, the lower the facilitation scores for Whites vs. Blacks (i.e., the more automatic prejudice towards Blacks), the less eye-contact and more blinking they had with the Black relative to the White interviewer.

Wilson et al. (2000) reported a correlation between a priming measure of implicit prejudice and the number of times White participants touched a Black confederate's hand when passing back and forth a pen. Bessenoff and Sherman (2000) used an affective priming procedure to measure participants' attitudes towards fat persons, as well as an explicit measure with three subscales (Anti-fat Questionnaire; Crandall, 1994). The implicit measure predicted the distance the participant would place their own chair from a fat woman, which was not predicted by any of the subscales in the questionnaire.

As is evident with the differential responses on explicit and implicit measures, automatic and controlled evaluations guide different behaviors. Perhaps more interesting, and more relevant to the research at hand, automatic evaluations can guide nonverbal behaviors even while deliberative evaluations are guiding more deliberative behavior such as verbal statements (Dovidio et al., 2002; Dovidio et al., 1997; McConnell & Leibold, 2001) or responses on explicit attitude scales.

Summary: Implicit and Explicit Attitudes Are Dissociable

The work reviewed here demonstrates quite thoroughly that implicit and explicit attitudes are dissociable. This dissociation is not with respect to consciousness, as was originally believed, but with respect to automaticity and control. In other words, while explicit attitudes are deliberative and therefore necessarily within awareness, implicit attitudes are automatic in that they are activated spontaneously, efficiently, and largely uncontrollably in response to a stimulus. However, they may or may not be outside of a person's awareness (Fazio & Olson, 2003). They are dissociated on the numerous explicit and implicit measures of attitudes (Asendorpf, Banse, & Mücke, 2002; Bessenoff & Sherman, 2000; Campbell, 1950; Fazio et al., 1995; Fazio & Olson, 2003; Greenwald et al., 1998; Jones & Sigall, 1971; Nosek, 2001, 2007; Payne et al., 2005). They can be affected or changed by different means (Bargh & Pietromonaco, 1982; Dasgupta & Greenwald, 2001; Fazio, 1990; Gregg et al., 2006; Herr et al., 1983; Insko & Oakes, 1966; Kerpelman & Himmelfarb, 1971; Kim, 2003; Lowery et al., 2001; Olson & Fazio, 2001, 2006; Petty, Tormala, Briñol, & Jarvis, 2006; Rydell et al., 2006; Wilson et al., 2000). And they affect

different aspects of behavior (Asendorpf et al., 2002; Bessenoff & Sherman, 2000; Chen & Bargh, 1999; Cunningham, Zelazo, Packer, & Van Bavel, in press; Devine, 1989; Dovidio, Kawakami, & Gaertner, 2002; Fazio, 1990; Fazio et al., 1995; Gawronski & Bodenhausen, 2006; Greenwald et al., 1998; McConnell & Leibold, 2001; Strack & Deutsch, 2004; Wilson et al., 2000).

While it is possible that explicit and implicit attitudes are separate representations (Greenwald & Banaji, 1995), it is also possible that explicit attitudes are simply further "downstream" from implicit attitudes (i.e., occurring later in cognitive processing of stimuli) (Cunningham, et al., in press; Gawronski & Bodenhausen, in press), and the different measures and manipulations merely affect what part of the "stream" is being tapped or changed. Regardless, what is crucial to the studies at hand is that implicit and explicit attitudes *can be* independently measured and manipulated, and affect different aspects of behavior. Specifically, it is relevant that explicit attitudes tend to guide conscious, controllable behavior, while implicit attitudes tend to guide automatic, spontaneous, and (often) nonverbal behavior.

The remaining two sections of this introduction review research on the influence of nonverbal behaviors on other people and their attitudes, and ties this to the dissociation of implicit and explicit attitudes, which leads directly into the research reported here.

Social Influence from Nonverbal Behavior

The final key to the work at hand is that nonverbal behaviors can influence others' attitudes and behavior. Some of the original work on the relationship

between nonverbal behaviors and attitudes comes from Albert Mehrabian (1967), who controlled the nonverbal behaviors of an experimenter towards a participant and a confederate. He found, perhaps unsurprisingly, that the orientation of the experimenter's head towards the participant predicted his / her rating of how much the experimenter liked him / her.

Indeed, most research on the effect of nonverbal behaviors on attitudes has focused on increased rapport and liking. Scheflen (1964) noted that posture sharing and increased rapport were correlated, and speculated that the effect could be bidirectional. LaFrance (1979) used a cross-lagged panel technique to show that rapport at time 1 was strongly correlated with posture sharing at time 2, but the correlation was even stronger between posture sharing at time 1 and rapport at time 2, lending evidence to Scheflen's hypothesis. Using an experimental method, Chartrand and Bargh (1999) demonstrated that when a confederate mimicked the behavior of a target it increased liking for the confederate, and enhanced the "smoothness" of the interaction with the participant.

Increased rapport is very important in some industries, especially service industries, and a series of studies examined the effects of nonverbal behaviors on customers' behaviors. Crusco and Wetzel (1984) showed that a light touch by a server significantly increased the tips received relative to customers not touched. Similarly Patterson (1986) showed that interpersonal touch increased compliance to a request for help. Applying mimicry to tipping, van Baaren, Holland, Steenaert, and van Knippenberg (2003) found that servers imitating their customers also led to greater tips.

Most relevant to the current work is the role of nonverbal behaviors in social influence. Woodall and Burgoon (1981) found that when verbal prosody and nonverbal behaviors were synchronized it increased the persuasiveness of the speaker. Burgoon, Birk, and Pfau (1990) hypothesized that nonverbal and prosodic cues can lead to the perception of credibility, which has been shown to increase persuasiveness (Hass, 1981; Hovland, Janis, & Kelley, 1953; Kelman, 1961). They videotaped participants giving a persuasive speech, and the participants' nonverbal behaviors were coded. Later, a second set of participants watched these videos, and rated the speakers on credibility and persuasiveness. Burgoon et al. found that immediacy of the speaker, increased eye contact, facial pleasantness and kinesic expressiveness were all correlated with persuasiveness.

With respect to actual persuasion, Ridgeway (1987) had participants watch two confederates discuss a jury case in which a financial award had to be given to a victim. One of the confederates had consistent nonverbal behaviors and speech across conditions, but the other confederate employed one of four nonverbal "styles" to accompany the same dialogue. She found that the "High-task" style, which included moderate voice level, straight and relaxed posture, level eyebrows, frequent eye contact with normal break-offs, and a rapid speech rate, led participants to be influenced by the confederate: they awarded an amount more similar to the "High-task" confederate than to the other confederate. Carli, LaFleur, and Loeber (1995) used a similar paradigm as Ridgeway (1987), and found that in addition to the "task" style, a "social" style – which included moderately high eye contact, relaxed posture, friendly facial expression, and

moderately calm gestures – led participants to change their opinion towards the confederate's more than other nonverbal styles. Both of these show that nonverbal behaviors can moderate persuasion.

Another more recent example Bailenson and Yee (2005) used immersive virtual environments to control the behavior of the "confederate" to a degree that is impossible with real human confederates. In this study, a participant donned virtual reality (VR) goggles and was immersed in an environment in which it appeared that another person was sitting opposite them at a table. The person proceeded to deliver a persuasive message about campus security policy. Although participants were told the other "person" was another participant communicating through the VR environment, the "virtual confederate" was actually a computer-generated avatar that was programmed to either mimic the participant's head movements with a 4 second delay, or "replay" the recorded movements of another participant. Bailenson and Yee (2005) found that when the avatar was mimicking the participants, they were more persuaded by the avatar's message than when the avatar was "replaying" the movements of another participant.

Overall, these studies together show that nonverbal behavior carries information that is independent from verbal information, and that these behaviors can influence the perception of the individual as well as the persuasiveness of their verbal statements, and can even directly affect opinion change.

Social Influence from Implicit Attitudes

It is evident from much research that implicit attitudes can guide nonverbal, unintentional, subtle behavior, and that this kind of behavior has subtle influential effects on recipients. However, despite recent compounding evidence that implicit attitudes are dissociable and potentially independent from explicit attitudes (Asendorpf et al., 2002; Rydell et al., 2006), no research has studied the possibility of a person's implicit attitude affecting others independent of her / his explicit attitudes. One study provided correlational evidence that a person's implicit attitude can be related to another person's attitudes or behavior. Chassin, Presson, Rose, Sherman, and Prost (2002) showed that a mother's implicit attitudes towards smoking predicted her child's own smoking behavior independent of her explicit attitude towards smoking.

The literature just reviewed has shown that explicit and implicit attitudes can be dissociable, that implicit attitudes can guide nonverbal behavior, and that one's nonverbal behavior can influence another's attitudes and behavior. The research described here seeks to show that one's implicit attitudes can influence another person's attitudes independent of one's explicit attitudes, and potentially outline the conditions under which this could occur. Since most social influence is assimilative (Mason, Conrey, & Smith, 2007) – the influence causes the recipient to want to be more like the source – it is reasonable to expect the influence of a person's implicit attitudes will also be assimilative. Additional support for this hypothesis comes from studies showing that assimilation occurs with the subtle or subliminal presentation of a prime, even if the blatant presentation of the same

prime leads to contrast (Lombardi, Higgins, & Bargh, 1987; Strack, Schwarz, Bless, Kübler, & Wänke, 1993).

However, it is not precisely clear whether to expect the effect of a person's implicit attitudes to be on another person's explicit or implicit attitudes, or both. It could be that the recipient of the influence would observe the source's behaviors and interpret their attitude correctly, consequently using that attitude as information to determine their explicit attitude, either through a deliberative process or a more heuristic one (Petty & Cacioppo, 1984). On the other hand, the person might "socially tune" their attitude to the inferred attitude of the source, thereby causing their implicit attitude to change in the direction of the source's implicit attitude (Sinclair, Lowery, Hardin, & Colangelo, 2005). Or there could be a combination of effects, such that the source's implicit attitude has an effect on both the recipient's explicit and implicit attitude. The exact mechanism and pathways of influence are an open empirical question.

To this end, I present three studies. In Study 1, the existing attitudes of a source are measured, and the independent influence of his / her explicit and implicit attitudes are examined in a persuasive context. In Study 2, the attitudes of the source toward an unknown person are *independently manipulated*, and then the source directly communicates his / her attitude towards the target to a recipient, and the recipient's attitudes are subsequently measured. In Study 3, the attitudes of the source are independently manipulated in a manner similar to Study 2, however, the recipient observes the source interacting with the target rather than hearing the source talk about the target. Thus, in the Study 1 the attitudes of

the source are measured, and in the Studies 2 and 3 the attitudes of the source are manipulated. In Studies 1 and 2 the source is *talking about* the target, while in Study 3 the source is *interacting with* the target.

Study 1

The purpose of this study is to examine the independent effects of naturally occurring implicit and explicit attitudes on another person's attitudes. President George W. Bush was chosen as the attitude object because he is likely to be familiar to participants and evoke strong attitudes, both implicit and explicit. Additionally, many of the participants in this study are likely to be students that come from conservative families that support the President, but the on-campus political atmosphere is definitively liberal, creating a norm that might contradict the participants' well-learned (and therefore automatic) attitudes. Therefore, it is reasonable to expect at least some of the participants will have conflicting implicit and explicit attitudes towards the President. The primary independent variables were the sources' measured attitudes. The dependent variable was the change in a recipient's attitudes after observing the source deliver a persuasive message about the attitude object (President Bush).

The primary hypothesis was that the nonverbal behaviors of the speaker would reveal his / her implicit attitudes, and either have a direct influence on the recipient's attitudes independent of either the source's explicit attitudes or the direction of the speech, or have a moderating effect on the attitude change caused by the message content. Similar to Carli et al. (1995), the nonverbal behaviors of

the speaker could simply moderate the persuasiveness of the speaker, rather than directly influence the recipients' attitudes towards Bush.

Method

This study was conducted in two phases. Participants in the first phase had their attitudes measured and were then videotaped delivering a pro-Bush and an anti-Bush persuasive message. Participants in the second phase of the experiment had their attitudes measured before and after watching one of the videos from Phase I.

Phase I: Participants

Twenty-nine undergraduate students from Indiana University participated in the first phase of the experiment for partial course credit. Three participants' data had to be dropped because they were unable or unwilling to deliver the persuasive message. Two additional participants' data had to be dropped due to video recording errors, leaving 24 total participants in the first phase.

Phase I: Procedure

After agreeing to participate in the experiment, participants were informed that this was a study about communication, and that they would complete a brief computer-based task and answer some questions about their opinions on President Bush.

All participants first completed a measure of their implicit attitudes toward President Bush. To measure the participants' implicit attitudes, we used the AMP (Payne et al., 2005). To recap, in this measure participants are informed that they will see a series of Chinese characters that represent different concepts. Their job

is to decide whether each Chinese character represents something that is *good* or something that is *bad.* They are told that in addition, there will be another photograph that is flashed briefly before the presentation of the Chinese character, but that they are to ignore this picture because it is simply a warning that the Chinese character would appear. Payne et al. showed that with this measure, even if participants are fully aware of the purpose of the priming photographs and are told to disregard them, participants are unable to fully correct and still tend to attribute some of their affect from the preceding prime to the Chinese character.

For sixty trials, one of 6 photographs of President Bush, or one of 6 photographs of unknown individuals matched for appearance, posture, and background appeared for 150 ms before being replaced by 1 of 40 randomly selected Chinese characters. Participants then had as much time as they needed to categorize the Chinese character as "good" or "bad" by pressing either the 'a' or the '5' key (see Figure 1).

After this the participants completed a measure of their explicit attitudes toward President Bush. They were shown a series of 12 statements about George W. Bush's success or failure as President, and were asked to indicate their agreement on a traditional seven-point Likert scale (see Appendix A). Half of the statements were framed positively, and half were framed negatively, and we made two lists of statements by reversing which questions were framed positively or negatively. These two lists were counterbalanced between participants. After this, they completed a "feeling thermometer" towards the President, which asks

them to give a number between 0 (very cold) to 100 (very warm) to indicate how they feel about the President.

After they completed the measures of their attitudes, they were told they would be videotaped reciting a speech about President Bush. They were given a speech about President Bush that was either supportive or critical of his Presidency (see Appendix B), and told they had as much time as they needed to learn the contents of the speech, but that they would not be allowed to read from it when they delivered the message to the video camera. Participants took from 2 - 8 minutes to learn the speech. After they said they were ready, the experimenter started the camera and gave the participants as much time as they needed to recite as much of the speech as they were able. The video recording ended when the participant said they could not remember any more of the message (this portion was edited out for later use). After this, the participants were given the other speech (either pro- or anti-Bush), and given the same instructions. Both messages were written to discuss similar issues and have a similar style, and the order in which participants read the messages (pro-Bush or anti-Bush first) was counterbalanced. The sources spoke for an average of 73 seconds (SD = 21.89), and this was not different between speech directions. After the participants had delivered this second speech, they were debriefed about the purpose of the experiment and thanked for their participation.

Phase II: Participants

Seventy-two undergraduate students at Indiana University participated in the second phase of the experiment for partial course credit. One participant had to

be dropped because they reported knowing the speaker, and one participant had to be dropped because they could read the Chinese characters in the implicit measure, leaving a total of 70 participants in the second phase.

Phase II: Procedure

After agreeing to participate in the experiment, participants were informed that the study was about communicating opinions. They were told that they would complete a brief computer task and then answer some questions about President Bush. After this, they would watch a video, do another computer-based task, and then answer more questions about President Bush. These participants completed the same AMP and explicit questions as participants in the first phase. After this, they were randomly assigned one of the videos made during the first phase, and watched the source delivering either the pro-Bush or anti-Bush message.

Once they watched the video, they rated their agreement to three statements on a seven-point Likert scale: "The speech was very supportive of the President," "The speaker has a very positive attitude towards the President," and "The speaker was very certain of his or her attitude towards the President." Next, they completed a second AMP and set of explicit questions so we could measure the change in their attitudes. To encourage these participants to thoughtfully consider their agreement with the statements in the second explicit measure, we had them rate their agreement with the statements from the second (oppositely phrased) list of statements. For example, if the participant first rated their agreement with the statement, "President Bush's presidency has been a success," they would then rate

their agreement with the statement, “President Bush’s presidency has been a failure.”

Results

The Affect Misattribution Paradigm (AMP) compares the affect elicited by photographs of the President to the affect elicited by similar photographs of strangers. To quantify this affective difference, the measure compares the categorization of Chinese characters that were preceded by a photograph of the President to those that were preceded by a photograph of someone else. The actual AMP score is the difference in the proportion of characters categorized as ‘good’ when preceded by a photograph of the President and the proportion categorized as ‘good’ when preceded by a photograph of someone else. Thus, the more characters categorized as good after seeing a picture of Bush relative to the number categorized as good after seeing a picture of someone else, the more positive their implicit attitude towards Bush. The most favorable (pro-Bush) AMP score is 1 and the most negative (anti-Bush) AMP score is -1.

The explicit questions that were framed negatively were reverse-coded so all questions were scored such that 7 meant very positive attitudes towards Bush. There were no significant differences between the two (oppositely phrased) lists of twelve questions, so this counterbalancing variable was left out of all further analyses. The twelve explicit questions were found to be very internally consistent (Cronbach’s alpha = 0.95), and a principle component factor analysis revealed all twelve questions loaded on a single component that accounted for

69.41% of the variance, so they were averaged together to yield a single measure of the source's explicit attitude towards Bush.

Distribution of the sources' attitudes

The distribution of the sources' implicit and explicit attitudes towards Bush is shown in Figure 2a. The implicit attitudes are highly clustered around the neutral point (0), but there were some participants who had very strong positive or negative implicit attitudes towards President Bush. The average AMP score was -0.042 (SD = 0.44), which was not significantly different from 0.

The sources had a wide range of explicit attitudes towards Bush, with a mean of 3.53 (SD = 1.56), just slightly negative towards Bush, which was also not significantly different from the neutral point (4). It is easily seen from Figure 2a that participants' implicit and explicit attitudes towards President Bush are not perfectly congruent, and in fact the correlation between the measures was only 0.37, which was not significantly different from 0. However, there were no participants that had strong implicit attitudes and strong explicit attitudes that were incongruent.

The average rating of Bush on the feeling thermometer was 43.67 (SD = 28.5) (slightly but not significantly cool towards Bush), and this measure was moderately correlated with the sources' AMP (r = 0.421, $p < 0.05$) and highly correlated with the sources' explicit rating of Bush (r = 0.872, $p < 0.001$).

Distribution of recipients' initial attitudes

Again, the explicit questions were highly internally consistent (Cronbach's alpha = 0.96), and loaded on a single factor that accounted for 69.01% of the

variance, so the questions were averaged to create a single measure of explicit attitudes towards Bush. The distribution of the recipients' implicit and explicit attitudes towards Bush is shown in Figure 2b. As can be seen, the recipients had a wide range of implicit and explicit attitudes towards Bush. The average AMP score was -0.03 (*SD* = 0.52), and the average explicit attitude was 3.79 (*SD* = 1.7), comparable to the values of the sources' implicit and explicit attitudes. The average feeling thermometer was 45.93 (*SD* = 32.11). The random assignment of participants to pro- or anti-Bush speeches and to source videos was effective: there were no significant differences in the initial attitudes of the recipients in either condition, and there were no significant correlations between the sources' attitudes and the recipients' initial attitudes. The recipients' implicit and explicit attitudes *were* significantly correlated, however ($r = 0.707$, $p < 0.001$). The feeling thermometer was also significantly correlated with the recipients' initial implicit ($r = 0.671$, $p < 0.001$) and explicit ($r = 0.921$, $p < 0.001$) attitudes. It was not necessary for the recipients to have congruent or incongruent attitudes, but it can be seen in Figure 2b that incongruent implicit and explicit attitudes sometimes existed.

Recipient ratings of the source and message

After watching the video of the source delivering the pro- or anti-Bush message, they were asked to rate how positive the speech was towards Bush, how positive the speaker was towards Bush, and how certain the speaker seemed to be about his / her attitude. The recipients' rating for each of these questions was subjected to an ANCOVA, with the direction of speech as a fixed factor and the

speakers' implicit and explicit attitudes and thermometer ratings as covariates. For the rating of the positivity of the speech, the only significant factor was the direction of the speech ($F(1,64) = 552.831$, $p < 0.001$), which simply indicates the recipients understood the meaning of the speech. For the rating of the positivity of the speaker, however, in addition to the main effect of the direction of the speech ($F(1, 64) = 248.113$, $p < 0.001$), there was also an effect of the source's implicit attitude ($F(1, 64) = 5.77$, $p < 0.05$), such that more *positive* implicit attitudes led to a *lower* perceived positivity of the speaker. The implications of this result will be discussed later.

The source's implicit attitude had a similar effect on the recipients' ratings of the certainty of the speaker. The more positive the source's implicit attitude towards Bush, the less certain they seemed to the recipient, ($F(1, 64) = 6.027$, $p < 0.05$). The analysis included the source's explicit attitude and the direction of speech, which means that this is not an effect of the sources' implicit attitudes conflicting with the message they were delivering or their explicit attitudes. Instead it means that, *ceteris paribus*, the more negative the source was implicitly towards Bush, the more certain they seemed to the recipient.

The influence of the source on the recipients' attitudes.

The main hypothesis was that the implicit attitude of the source would have an assimilative effect on the recipients' attitudes independent of the effect of the sources' explicit attitudes or the content of the speech. The influence of the source on the recipient is measured by the change in the recipients' attitudes after watching the video of one of the sources. Again, these differences were subjected

to an ANCOVA with the direction of speech as a fixed factor and the speakers' implicit and explicit attitudes and thermometer ratings as covariates.

The change in the recipients' AMP scores was normally distributed with a mean of -0.013 (SD = 0.33). There were no significant predictors of the change in the recipients' implicit attitudes, implying that there is no clear cause for the participants' change in attitudes beyond noise in the measure.

The change in the recipients' explicit scores was also normally distributed with a mean of -0.057 (SD = 0.552). Again, there were no significant predictors of the change in explicit attitude, although the direction of the speech trended in the expected direction, such that pro-Bush speeches led to positive change and anti-Bush speeches led to negative change (see Figure 3).

Six of the recipients failed to complete the second thermometer rating, so they were excluded from the relevant analysis. The change in the recipient's thermometer was normally distributed with a mean of -0.936 (SD = 5.11). In this case, the sources' own thermometer rating had a marginally significant effect on the recipients ratings ($F(1, 58) = 2.826$, $p < 0.1$), such that the warmer the source felt towards the President, the more positive the change in the recipients' thermometer rating.

Contrary to predictions, the implicit attitude of the source did not seem to influence the change in the recipients' attitudes. There were a large number of sources with relatively neutral implicit attitudes, so it could be of interest to focus the analysis only to those sources with non-neutral implicit attitudes. Because AMP scores are symmetric around 0, the sources with an absolute AMP score less

than 0.2 were excluded. In this way the variability in the implicit attitudes is retained while removing the large portion ($N = 14$) of sources with essentially no meaningful implicit attitude toward Bush. The remaining 10 source participants had an average AMP score of -0.057 ($SD = 0.69$), an average explicit rating of 3.25 ($SD = 1.41$) and an average thermometer rating of 36.2 ($SD = 26.73$), none of which were significantly different from the neutral points on their respective scales.

There were 25 recipients who watched the videos of these 10 sources with non-neutral implicit attitudes, 13 in the pro-Bush condition and 12 in the anti-Bush condition. The analysis of the ratings of the sources was similar to the analysis with all of the sources. The only significant effect on the rating of the positivity of the speech was the direction of the speech, $F(1, 20) = 165.407$, $p < 0.001$. The direction of the speech also significantly affected the rating of the positivity of the speaker ($F(1, 20) = 119.577$, $p < 0.001$), and there was a reverse effect of the source's implicit attitude ($F(1, 20) = 4.22$, $p = 0.05$); the more negative the sources' implicit attitudes, the more positive the recipient rated the speaker's attitude towards Bush. And finally, the source's implicit attitude was the only (marginally) reliable predictor of the rating of the certainty of the speaker ($F(1, 20) = 3.656$, $p < 0.08$), such that more positive the speaker's implicit attitudes towards Bush, the less certain he or she seemed to the recipient.

Thus, even with the reduced number of sources, the basic results of the first part of the analysis with all of the sources are replicated. When looking at the change in recipients' attitudes, however, there is an interesting difference. While

there is still no significant effect of the source on the change in the recipients' implicit attitudes, when focusing only on those sources with strong implicit attitudes there is a significant effect of those implicit attitudes on the recipients' explicit attitudes. As can be seen in Figure 4, there is a standard persuasion effect that is marginally significant, ($F(1, 20) = 3.203$, $p < 0.10$), such that pro-Bush messages tend to raise the explicit rating of Bush and vice-versa. However, there is also a distinct, significant negative trend ($F(1, 20) = 6.149$, $p < 0.05$) such that sources with more positive implicit attitudes towards Bush had a more negative effect on the recipients' explicit ratings. When including the two-way interaction between the sources' implicit and explicit attitudes in the model, there are no significant predictors of the change in the recipients' explicit attitudes, implicit attitudes, or thermometer ratings.

Discussion

In this study, the pre-existing attitudes of the source participants towards the President were measured, and they delivered one persuasive message in favor and one opposed to the President. The effect of this message on recipients' attitudes was measured, with the prediction that the implicit attitudes of the source would have an effect on the recipients' attitudes independent from the source's explicit attitudes or the content of the persuasive message. The attitudes of the sources varied widely and their implicit and explicit attitudes were only marginally correlated. There were many sources with relatively neutral implicit attitudes, but there were a few that had strong explicit and neutral implicit, or strong implicit and neutral explicit attitudes. However, there were no sources with conflicting

strong implicit and explicit attitudes, so the strongest test of the hypothesis was not possible.

Unfortunately, there seemed to be no systematic change in either the recipients' explicit or implicit attitudes. There seemed to be no effect of the content of the message, the source's explicit attitude, the source's implicit attitude, or the source's feeling about Bush (as measured by the thermometer) on the recipients' implicit or explicit attitudes. There did seem to be a small effect of the source's thermometer rating on the change in the recipients' thermometer rating, but overall it seemed that the main hypothesis was not confirmed.

Although the recipients' attitudes did not seem to be affected by the source's implicit attitudes, there was evidence that they could detect the implicit attitude. The recipients rated the positivity of the message, the positivity of the source, and the certainty of the source. The implicit attitude of the source seems to have affected the perceptions of the positivity and certainty of the source such that more positive attitudes towards the source led to *lower* perceptions of positivity and *lower* perceptions of certainty. These effects were independent of the source's explicit attitudes or the message content. Thus, the source's implicit attitude seems to have had an opposite effect on the perceptions of their attitude.

Additionally, when focusing only on those sources with non-neutral implicit attitudes, the sources' implicit attitudes predicted a change in the recipients' explicit attitudes, independent of the sources' explicit attitudes. Again, this effect was opposite the expected direction, so those with more positive implicit attitudes towards Bush caused the recipients of their messages to explicitly become more

negative towards Bush. This corresponds with their perception of the source's attitude, which was also negatively correlated with the sources' implicit attitudes.

It is unclear why the sources' implicit attitudes had a reverse effect on the recipients. As can be seen in Figure 4, there is no interaction between the source's implicit attitudes and the direction of the speech, so the reverse change in the recipients' attitudes is not caused by sources delivering a speech that contradicted their implicit attitudes.

Since the source's attitudes were measured rather than manipulated, this is a correlational study and it is possible that people who are pro-Bush differ from those that are anti-Bush, such that their nonverbal behaviors communicate different things. For instance, persons who hold anti-Bush attitudes may be more authoritarian and therefore seem more certain of their attitudes. Similarly, some variable that was not measured could be correlated with positive or negative attitudes towards Bush and cause recipients to interpret their behavior opposite from their true attitude, so the speakers are perceived to be more positive when in fact they are more negative, subsequently affecting the persuasiveness of the speech.

To gain greater control over these possible confounding variables, Study 2 is an experimental design with the attitudes of the source manipulated rather than measured.

Study 2

In order to have greater control over the sources' attitudes, they had to be about a novel attitude object – a fictitious person named "Bob" – and therefore

were not as well-established as naturally occurring attitudes, but the recipients' attitudes were entirely based on the sources' communication. This design also allowed experimental control over the attitudes of the source, ensuring that their implicit and explicit attitudes were truly orthogonal. In addition, rather than watching recording the of source's impression of the target, the recipient directly interacted with the source. While this may have created more variability in the source's communication, it also allowed more information to be conveyed through nonverbal communication.

The main hypothesis of this study is that the source will communicate her / his implicit attitudes through nonverbal behaviors, independent of the verbal communication to the recipient. This could be conveyed through facial expressions, body language, or the manner in which she / he describes Bob to the recipient. The source's implicit attitude could directly affect the recipients' attitudes towards Bob, or could moderate the effect of the source's explicit attitude.

Methods

Participants

Forty-seven pairs of undergraduate students from Indiana University participated in this study for partial course credit, for a total of 94 participants.

Procedure

Participants were randomly assigned to the role of the source or the recipient. After receiving basic information about the purpose of the experiment, the

participant assigned to the role of the recipient was asked to wait in a private cubicle until their part of the experiment began.

The participant assigned to the role of the source was told that they would be forming an impression of a person named 'Bob', and after answering some questions about their impression and doing a short computer task, they would then communicate their impression to the other participant, and that this discussion would be video taped. They were then sat in front of a computer where they began the task of forming an impression about 'Bob'.

The purpose of this impression formation task was to independently manipulate the source's implicit and explicit attitudes towards the fictional person 'Bob'. To accomplish this, we used the paradigm developed by Rydell et al. (2006). In this paradigm, participants were presented with a picture of Bob and a corresponding behavior, which they were asked to categorize as characteristic or uncharacteristic of Bob. Half of the participants were given feedback that the positive behaviors were characteristic of Bob, and the other half were given feedback indicating the negative behaviors were characteristic of him. Unknown to the participants, immediately prior to the presentation of the picture of Bob, an evaluative prime was subliminally presented. Half of the participants were given positive evaluative primes (e.g., "happy", "sunshine") and the other half was given negative primes (e.g, "pain", "guilt"). All participants were asked to categorize the same 100 behaviors (50 positive and 50 negative), and consequently were presented with 100 subliminal (all positive or all negative) evaluative primes. This allowed the participants to form an explicit attitude

through the categorization of the behaviors, and develop an independent implicit attitude through the classical conditioning by the primes (c.f., Olson & Fazio, 2001). Thus, when the primes and behaviors have congruent valences, the participants' explicit and implicit attitudes should be congruent, but when the primes are positive but the behaviors are negative, or vice-versa, the attitudes of the participant should be incongruent.

Once the sources formed their impressions of Bob (and their implicit attitudes were correspondingly shaped), they were given an IAT measure of their implicit attitudes towards Bob. The IAT was used in this study rather than the AMP because the previous work using this paradigm used the IAT to measure the influence of the primes.

Implicit Association Test.

In this IAT there were five blocks, only two of which were the "critical blocks" that constitute the measure of the implicit attitude. At the beginning of the task participants were told that we were interested in their ability to categorize objects while distracted. Participants were informed that they would be categorizing pictures and words, and that they should be as fast as possible while minimizing errors.

In Block 1, participants were asked to categorize a randomly ordered presentation of 10 positive and 10 negative words as "good" or "bad" by pressing the 'a' or '5' keys (respectively) on the keyboard.

In Block 2, they were instructed to categorize pictures as 'Bob' or 'Not Bob' using the same keys. For this block they were given corrective feedback after

their categorization response. They did this twenty times with a random presentation of the picture of 'Bob' and 5 pictures of similar White males.

Block 3 was the first critical block, in which the participants had to respond to the picture of 'Bob' *and* good words with the 'a' key and respond to pictures of 'Not Bob' *and* bad words with the '5' key. This will be referred to as the 'compatible' block (although in actuality it was only compatible for half of the participants). Participants categorized forty trials of alternating words and pictures randomly sampled from all of the words and pictures. They were then told that the pictures were going to be reversed, and that they would have a chance to practice this new combination.

Block 4 was the same as Block 2, only now the keys were reversed, so participants had to respond to pictures of 'not Bob' with the 'a' key and respond to the picture of Bob with the '5' key. As in Block 2, there were twenty trials, the order of the pictures was randomized, and they received corrective feedback after their categorization responses.

Block 5 was the second critical block, and was similar to Block 3, only now pictures of 'Not Bob' and good words were paired with the 'a' key, and the picture of 'Bob' and bad words were paired with the '5' key. This will be referred to as the 'incompatible' block. As in Block 3, participants had forty categorization trials.

After they completed the IAT, they were asked to rate Bob on a series of six bipolar evaluative scales, such as, "Rate Bob on a scale from very agreeable (9) to very disagreeable (1)." This constituted the measure of the source's explicit

attitude towards Bob. After this they completed a feeling thermometer towards Bob, and then were told that this part of the experiment was over, and that they should contact the experimenter.

When the participant did so, the experimenter informed the other participant (assigned to the role of the recipient) that it was time for their participation. The experimenter led both participants to a room with two chairs and a video camera. The experimenter informed the participants that this was a study on forming and communicating impressions, and that the job of the source was to communicate their impression about the person they just learned about. They were told to start by saying his name, and then describe him as though they were going to introduce him to the other participant. The recipients were given a picture of Bob and told that their job was to form an impression of Bob based on what the source told them, and that afterwards they would complete a short computer task and answer some questions about Bob. The experimenter then began recording, and left the room (but remained within earshot).

After the source finished describing 'Bob', the experimenter came back into the room, stopped the video recording, thanked the source for their participation and debriefed them about the purpose of the experiment. The recipient was reminded that they would complete a short computer task and answer some questions about Bob. The recipient then completed the same IAT described above, rated Bob on the same 6 semantic differential scales, and completed the same feeling thermometer. When they had completed these measures, they were thanked for their participation and debriefed about the purpose of the experiment.

Results

Manipulation of source's implicit and explicit attitudes

To be sure that the manipulation of the source's implicit and explicit attitudes was successful, the effect of the primes and behaviors on the source's IAT scores and explicit ratings of 'Bob' was examined. The prediction was that the primes would affect the sources' implicit attitudes independent of the behaviors, and the behaviors would predict the explicit ratings independent of the primes. To test this, we conducted a 2 (primes; positive / negative) x 2 (behaviors; positive / negative) ANOVA on the IAT scores and the explicit ratings.

The explicit ratings consisted of six 9-point semantic differential scales with different endpoints (see Appendix C). The ratings were highly consistent (Cronbach's alpha = 0.983), and a principal components analysis revealed all of the questions loaded on a single factor that accounted for 92.07% of the variance, so a single explicit rating was created from the average of the six scales (with the appropriate questions reverse-scored). Across all subjects in all conditions the average rating was 4.98 (SD = 3.704), very close to (and not significantly different from) the neutral point (5) on the scale. The distribution of explicit attitudes was highly non-normal (in fact, highly bimodal; see Figure 5a), and the error variance was significantly unequal across conditions (Levene's $F(3, 43) = 6.7$, $p < 0.001$), so the analyses were done on the ranks of the average ratings. These rank values were subjected to a 2 (behaviors; positive / negative) x 2 (primes; positive / negative) ANOVA, and the behaviors were the only significant predictor of the explicit rating ranks, $F(1, 43) = 150.629$, $p < 0.001$. As can be

seen in Figure 5a, the behaviors had a very strong effect ($\eta^2 = 0.778$) in the predicted direction and there was no significant effect of the Primes.

To calculate the IAT scores, we followed the procedure suggested by Greenwald, Nosek, and Banaji (2003). The resulting score, *D*, is the difference in reaction times on the compatible and incompatible trials (Blocks 3 & 5), divided by the standard deviation of the reaction times from both blocks. This measure is more consistent across varying response times and does not require the exclusion of very long or very short reaction times. Across all conditions, the average *D* was -0.3 (*SD* = 0.432), which is slightly negative towards Bob, and this was significantly different from the neutral point, 0, $t(46) = -4.794$, $p < 0.001$. It is unclear why the participants formed a negative impression towards Bob, and this will be discussed later in the manuscript.

When the sources' IAT scores were subjected to the 2 x 2 ANOVA, the results were surprising. Instead of the primes predicting the IAT scores independent of the behaviors, the *behaviors* were predicting the scores independent of the primes, and in the opposite direction to that predicted (see Figure 5b). This effect was reliable but small, $F(1, 43) = 6.236$, $p < 0.05$, $\eta^2 = 0.127$. It appears from Figure 5b that the primes had the predicted effect with the positive behaviors, but this trend was not reliable.

Surprisingly, this result actually replicates the findings of Rydell et al. (2006). In their study, they only looked at the conditions with incongruent behaviors and primes. Exclusively looking at the incongruent conditions, it could appear with this data that behaviors predicted explicit ratings and the primes predicted the

implicit attitudes. However, when looking at both congruent and incongruent conditions, it appears that the implicit attitudes were simply influenced by the behaviors, but opposite the expected direction. The implications of this will be elaborated in the discussion. Fortunately, even though the manipulation did not have the predicted effect, it was still possible to test the main hypotheses. As can be seen in Figure 6a, there are sources with congruent and incongruent implicit and explicit attitudes, both positive and negative, so the independent effects of the sources' attitudes on the recipients were examined.

Effect of Source Attitudes on Recipients' Impression

For the two measures of the recipients' attitudes – the explicit questions and the IAT – there are two possible predictors: the source's explicit attitude and the source's implicit attitude. As with the sources' explicit attitudes, the recipients' explicit attitudes were clearly bimodal (see figure 6b). Nonetheless, the average explicit rating was 4.993 (SD = 2.99), which was not significantly different from the neutral point (5) or the sources' explicit attitudes.

To examine the independent effects of the source's explicit and implicit attitudes on the recipients' explicit attitudes, we conducted a simple regression with the explicit attitudes as the dependent variable and the sources' attitudes as the predictors. The entire model accounted for 80.5% of the variance (a fairly good fit), but the sources' explicit attitudes were the only significant predictor of the recipients' explicit attitudes, $\beta = 0.929$, $p < 0.001$. The impact of the sources' explicit attitudes is evident in Figure 7, and although it appears there is a trend for

more positive implicit attitudes in the source to lead to more positive explicit attitudes in the recipient, this effect was not significant.

Next, the recipients' implicit attitudes were examined. Three of the recipients failed to follow the instructions of the IAT and did not reverse their responses to the target and the foil in the practice block 4 or in the critical block 5, so had to be excluded from this analysis. The average IAT score for the remaining recipients was -0.398 (SD = 0.437), which was significantly different from the neutral point (0), $t(43) = -6.037$, $p < 0.001$, but not significantly different from the sources' implicit attitudes. This general negativity corresponds with source's implicit negativity, which will be discussed later. To determine the effect of the sources' attitudes on the recipients' implicit attitudes, the same regression was conducted on the recipients' IAT scores as was done for their explicit ratings. In this case the model did not fit particularly well ($R^2 = 0.138$), and the only significant predictor was the sources' explicit attitudes ($\beta = -0.374$, $p < 0.05$) (see Figure 8), which was negatively related to the recipients' IAT scores. The sources with more positive explicit attitudes towards the target negatively influenced the recipients' implicit attitudes.

Discussion

In this study, the source's attitudes were manipulated rather than measured. To induce congruent or incongruent explicit and implicit attitudes, we borrowed a paradigm from Rydell et al. (2006). The manipulation seems to have exactly the predicted effect on the explicit ratings of the target – the feedback they received while categorizing behaviors as characteristic or uncharacteristic of the target

influenced their explicit attitude towards the target in the expected direction, and the primes had no effect on the ratings. This effect was strong and very reliable, and accords with previous work on impression formation (Asch, 1946; Hamilton & Sherman, 1996; Kerpelman & Himmelfarb, 1971).

The manipulation of the implicit attitudes did not have the predicted effect, however. Based on the results of Rydell et al. (2006), the primes were expected to affect the IAT scores independent of the behaviors. However, instead it was found that the behaviors negatively predicted the IATs, so positive behaviors led to more negative IATs and negative behaviors led to more positive IATs. In addition to this effect of the behaviors, there was also an overall tendency for the sources to have a negative implicit attitude towards the target. By observing the recordings of the sources communicating their impression of the target to the recipient, it is possible to make inferences about why this effect may have occurred. In both conditions, the sources described the target as *impossibly extreme*, so that when they were receiving feedback that the positive behaviors were characteristic of 'Bob', they described him as the perfect human being; one participant even said, "Basically, the only person more perfect than this guy is Jesus." And in the negative condition one participant explained, "This guy is the worst possible person you can imagine."

It is possible that this extremity in the good condition caused a comparative reaction, so participants *implicitly* didn't like the target because he was *too* good. This is comparable to the findings of Herr et al. (1983), who found that moderate primes led to assimilative judgments, whereas extreme primes led to contrast.

Another possibility is that although participants were told that the behaviors were merely characteristic of the target and not necessarily actual behaviors of the target, the impression formation task may have led the participants to incorporate all behaviors in their impression. While the individual behaviors were believable, when put in combination they may have seemed impossible, causing participants to form an opposite automatic evaluation.

This result has implications for the work using the manipulation because it does not contradict the findings from the original study (Rydell et al., 2006). In that study, they were focused on showing that incongruent implicit and explicit attitudes could be induced in participants and that these attitudes could be reversed. Naturally, the researchers attributed the negative implicit attitudes to the primes, but they did not have a congruent condition as a control. It is possible that it was the behaviors causing the incongruent explicit and implicit attitudes, as they did in this study. One goal of Study 3 was to make the behaviors of the target more believable when taken as a whole, and see if this effect of the behaviors on the implicit attitudes of the source is replicated.

Despite this unpredicted effect of the manipulation on the source's attitudes, there was still enough variation in the sources' attitudes to examine the effect of the sources' attitudes on the recipients. Unfortunately, the predicted effect of the sources' implicit attitude on recipients' attitudes independent of the sources' explicit attitudes was not found. However, the recipients seemed to have formed their impression of the target in the same way as the sources: sources with positive explicit attitudes towards the target induced a negative implicit attitude in

the recipient, just like positive behaviors induced a negative implicit attitude in the source. Additionally, there was an overall tendency for the recipients to have a negative implicit attitude towards the target, just like the sources' implicit attitudes.

A likely explanation for this is that the source communicated their explicit impression of the target so faithfully that the recipients developed the same distribution of implicit and explicit attitudes. This implies that it must have been the content of the behaviors that induced the negative implicit attitudes and caused the positive explicit impression to negatively affect the implicit attitudes of the recipient. In Study 3, we reduced the extremity and increased the believability of the overall impression by making the whole set of behaviors consistent and possible to have come from a single person in the hopes that this would eliminate the effect of the behaviors / explicit attitudes on the implicit attitudes of the person forming the impression.

Study 3

In Studies 1 and 2, the source was communicating his / her impression of the target (i.e., Bush or 'Bob') to a recipient. However, it could be that a person's implicit attitudes are most evident in his / her behavior when he / she is interacting with the target of the attitude. For instance, in Dovidio, Kawakami, and Gaertner (2002) and in the original validation of the IAT (Greenwald et al., 1998), the participant interacted with a member of the out-group, and those interactions were correlated with his / her responses on the implicit measures. Therefore, the goal of this study was to see if the implicit attitudes of the source

were revealed in an interaction with the target of the attitude, and if the behavior guided by these implicit attitudes would influence the attitudes of an observer of the interaction.

In addition, it was of interest whether the manipulation of implicit and explicit attitudes used in Study 2 would result in the same, unpredicted pattern in which the explicit categorization of behaviors incongruently affected the implicit attitudes of the source independent of the primes. As mentioned in the discussion of Study 2, one possible explanation for the reaction to the behaviors was the extremity implied by all of the behaviors together. To lessen this possibility, and to ensure that the same, college-aged person (the confederate) could have realistically performed all of the behaviors, we selected a subset from the original list of behaviors to use as stimuli in this study.

Methods

Phase I: Participants

Twenty-one undergraduate students from Indiana University participated in the first phase of the experiment for partial course credit. One participants' data had to be dropped because he / she failed to complete the IAT.

Phase I: Procedure

After agreeing to participate in the experiment, the participants were told that the study was about forming impressions of people, and that we were interested in how the manner in which one learns about a person affects the way he or she interacts with them. There were told participants were recruited from another study in which friends and acquaintances were asked to share experiences they

had with these participants, and they would learn about one of these participants. They were told we took the stories collected from the participant's friends and acquaintances and condensed them into short descriptions of the behaviors, and then made another list of behaviors that we judged to be uncharacteristic of the participant. We told them they would learn about the participant by categorizing these behaviors as characteristic or uncharacteristic, and after answering some questions and completing a short computer task (the IAT), they would have a short discussion with him.

Once they heard the instructions and had any questions answered, the participants sat in front of a computer to form an impression of 'Matt,' the target. The procedure was the same as that in Study 2, but instead of the picture of 'Bob', there was a picture of the confederate, and the set of behaviors was reduced from Study 2 (see Appendix D).

After forming an impression of Matt, the source rated the confederate on the same six semantic differential scales (except they were 7-point instead of 9-point) and completed the same IAT as in Study 2. For the IAT in this study the single picture of 'Bob' was replaced with five pictures of the confederate (including the one used in the impression formation task). The source was then asked to identify the 10 subliminal primes from a list of 20 positive and 20 negative words (or to guess, if they could not identify any) as a manipulation check. They were then told they were going to meet Matt, and led to a room with two chairs and a video camera.

The confederate, who was blind to the participants' condition, was sitting in one of the chairs, and the experimenter thanked them both for their participation (to maintain the cover story). The experimenter then started the camera while explaining that they would have 3 minutes to discuss the topic of, "Things to Do in Town." This topic was chosen to be personally interesting to the participants without requiring the confederate to reveal too much personal information that might bias the participants' reactions or contradict the impression they formed of him. The confederate was trained to engage in the conversation in a consistent manner that was not too friendly or unfriendly while keeping the conversation as natural as possible.

After the conversation, the confederate was thanked and asked to stay in the room, and the participant was taken to another room where they were given a process debriefing in which the suspicions of the participant were gradually probed while also informing the participant about the nature and purpose of the experiment. During this time, the confederate rated the participant and the interaction on six Likert scales (see Appendix E). After it was explained that 'Matt' was a confederate and that the behaviors they read about him were fabricated, they were given an opportunity to talk to Matt and ask any questions they might have. After they were done, they were thanked for their participation and allowed to leave.

Phase II: Participants

Thirty-eight people from Bloomington, Indiana (mostly undergraduate students at Indiana University) received eight dollars in compensation for their participation in the second part of the study.

Phase II: Procedure

After they agreed to participate in the experiment, the experimenter informed them that we were interested in how different parts of an interaction influence the way a person forms an impression. The recipients formed an impression of the target by watching one of the recorded interactions between the confederate and the participant. To ensure that the impression they were forming of the confederate was based primarily on the behavior of the participant, one half of the frame was replaced with a picture of the confederate (the same picture used in the impression formation procedure in the first part of the study), so the recipients could only see the behavior of the participant (see Figure 9).

Once they had watched the video interaction, the participants completed the same IAT and answered the same explicit questions as the participants in the first phase of the experiment. After completing these, they were asked if they felt they were able to form an impression of the target, and then were debriefed on the purpose of the experiment.

Results

Sources' Awareness of Primes

The sources were given a randomized list of 40 words and asked to circle the 10 that were primes. Therefore, 10 of the words were correct, and 10 others were of the same valence. The probability of correctly circling 6 or more of the words

by chance is < 0.05, and 7 of the 20 sources did so, indicating they were able to see the primes. However, in work using evaluative conditioning (e.g., Olson & Fazio, 2001) the primes were clearly perceptible, so it is possible the primes would still have had the desired effect. Except where noted, the removal of these seven sources did not meaningfully change the results.

Manipulation of Sources' Implicit and Explicit Attitudes

As in Study 2, the effect of the primes and behaviors on the source's IAT scores and explicit ratings of 'Matt' was examined. To replicate the results of Rydell and colleagues (2006), the primes should independently lead to changes in the implicit attitudes and the behaviors should independently lead to changes in explicit attitudes. To replicate the results of Study 2, the behaviors should lead to congruent changes in explicit attitudes and incongruent changes in implicit attitudes. To test this, a 2 (primes; positive / negative) x 2 (behaviors; positive / negative) ANOVA was conducted on the IAT scores and the explicit ratings.

The six 7-point semantic differential scales were again tested for internal reliability, and they were again found to be highly consistent (Cronbach's alpha = 0.971), and a principal component analysis revealed all of the questions loaded on a single factor that accounted for 87.62% of the variance, so a single explicit rating was created from the average of the six scales (with appropriate questions reverse-scored). The average rating across all subjects was 4.175 (SD = 2.373), slightly but not significantly negative. The error variances were significantly different across conditions (Levene's $F(3,16) = 11.564$, $p < 0.001$), so as before, the analysis was done on the ranks of the explicit ratings. The 2 x 2 ANOVA

revealed a strong effect ($\eta^2 = 0.754$) of the behaviors on the ranks of the explicit ratings, $F(1,16) = 49.087$, $p < 0.001$. There was also a small ($\eta^2 = 0.172$) but marginally reliable effect of the primes on the explicit attitudes, $F(1,16) = 3.329$, $p < 0.09$, such that negative primes led to more negative explicit attitudes. This can be seen in Figure 10a. When excluding those sources that correctly identified the primes, only the behaviors had a reliable effect on the sources' explicit attitudes ($F(1,9) = 36.45$, $p < 0.001$)

The source's IAT scores were again calculated using the procedure suggested by Greenwald et al. (2003). Across all conditions, the average D was -0.522 (*SD* = 0.425), which was significantly lower than neutral, $t(19) = -5.486$, $p < 0.001$. It appears that all participants formed negative implicit attitudes towards the target. This replicates the general negativity found in Study 2, and will be discussed later. When the IAT scores were subjected to the 2 x 2 ANOVA, the effects did not replicate those in Study 2. In this case, primes had a small and marginally reliable effect on the sources' IATs, $F(1,16) = 3.262$, $p < 0.09$, with positive primes leading to more negative IAT scores. Behaviors did not have a reliable effect on the IATs. It seems as though there is an interaction between the two (see Figure 10b), but the interaction was not significant. However, when only looking at the sources who could not identify the primes, the effect of the primes on the sources' implicit attitudes was still marginally significant ($F(1,9) = 3.487$, $p < 0.1$) in the reverse direction (so positive primes led to negative IATs), and the interaction was reliable ($F(1,9) = 5.318$, $p < 0.05$), so the reverse effect of the primes was very large with negative behaviors (*post-hoc* $t(5) = 2.661$, $p < 0.04$,

Cohen's $d = 2.13$), but not significant with positive behaviors. In either case, it seems as though the primes had the opposite effect from what was predicted, particularly when looking at the negative behaviors.

Comparing sources' attitudes in Study 2 and 3

It appears as though the procedure had different effects between the two studies. Because essentially the same procedure was used to manipulate the sources' implicit and explicit attitudes (Rydell et al., 2006) in Studies 2 and 3, it is possible to compare the studies on the dependent variables. The explicit ratings in Study 2 were on a nine-point scale and those in Study 3 were on a seven-point scale, so the scores were transformed to proportions such that the lowest value on the scale was 0, the midpoint was 0.5, and the highest was 1.0. To examine the effect of the behaviors and primes across both studies, we conducted a 2 (Study 2 v. Study 3) x 2 (positive v. negative behaviors) x 2 (positive v. negative primes) multivariate ANOVA with the sources' IATs and explicit ratings of the target as the dependent variables. However, Levene's test revealed the error variances were significantly different between groups ($F(7,92) = 3.213$, $p < 0.005$), so the rank-transformed explicit ratings were used rather than the raw scores.

There was no main effect of the change in procedure between experiments on the explicit ratings, and naturally the main effect of the behaviors on the explicit ratings remained highly significant ($F(1,92) = 170.975$, $p < 0.001$). There was also a reliable interaction between the change in procedure and the effect of the behaviors on the explicit ratings, $F(1,92) = 4.92$, $p < 0.05$, such that the negative behaviors in Study 2 led to even more negative explicit ratings than those in Study

3. This is exactly the effect we would expect, as the behaviors were made less extreme in Study 3.

The effect of the changes in procedure on the sources' implicit attitudes is somewhat more complex. To begin with, there was a main effect of the changes in procedure, such that those in Study 3 had much more negative implicit attitudes towards the target (M = -0.52, SD = 0.425) than those in Study 2 (M = -0.285, SD = 0.443), $F(1,92) = 5.309$, $p < 0.05$. The main effect of the behaviors on the implicit attitudes is reliable across studies, $F(1,92) = 9.245$, $p < 0.005$, such that positive behaviors led to more negative implicit attitudes than did negative behaviors. This suggests that if the unexpected effect of the behaviors was due to the extremity of the behaviors in Study 2, reducing the extremity of the behaviors in Study 3 did not eliminate the effect. There was also a marginal interaction between the change in procedure and the primes ($F(1,92) = 2.84$, $p < 0.1$), such that positive primes had a more negative effect on the implicit attitude in Study 3 than in Study 2 (see Figure 11). Because the primes were not changed between the studies, it seems as though the change in behaviors or the expectation for an interaction must have had an effect on the sources' implicit attitudes.

Effect of Source on Target

Before examining the effect of the sources' attitudes on the recipient, it is of interest to examine the interaction between the sources and the target (the confederate). The target rated the sources and the interaction on six semantic differential scales. Apparently, however, the target did not explicitly notice any differences in the participants' behavior towards him. The six scales were

included in a multivariate ANOVA (to control for covariance between the scales) with the primes and behaviors as categorical predictors and the sources' implicit and explicit attitudes as covariates. When looking at all of the sources or only those who could not identify the primes, neither the manipulation of the sources' attitudes nor the sources' attitude themselves significantly predicted the confederate's ratings of the participants or the interaction.

Effect of Source's Attitudes on Recipient's Impression Formation

Although there were no sources with positive implicit and positive explicit attitudes (see Figure 12a), there was enough variability in the sources' attitudes to examine the effect on the recipients. Unlike the source's bimodally distributed attitudes, the recipients' implicit and explicit attitudes appear to be more normally distributed and centered in the quadrant of attitudes (relatively positive implicit and explicit attitudes) not occupied by the sources (Figure 12b). The average explicit attitude was 5.39 (SD = 0.819) on the 7-point scale, which was significantly greater than neutral, $t(37) = 10.47$, $p < 0.001$, indicating that the recipients generally formed a positive explicit attitude towards the target. This was also significantly greater than the sources' explicit attitudes, as determined by a paired samples t-test ($t(37) = -3.016$, $p < 0.005$).

To test the effect of the sources' attitudes on the recipients' explicit attitudes, the recipients' explicit attitudes were submitted to a regression with the sources' implicit and explicit attitudes as predictors. Unfortunately, the model accounted for only 1% of the variance, indicating that the sources' attitudes had essentially no effect on the recipients' explicit attitude.

The recipients' average implicit attitude was -0.601 (SD = 0.314), which was significantly less than neutral, $t(37) = -11.816$, $p < 0.001$, indicating recipients generally formed a negative implicit attitude towards the target. A paired t-test revealed this was not, however, significantly different from the sources' implicit attitudes. The recipients' implicit attitudes were also fit to a regression model with the sources' explicit and implicit attitudes as predictors, and again, the model had a very poor fit, accounting for only 6% of the variance.

Noting that the sources' explicit attitudes are bimodally distributed, their explicit attitudes were converted to a categorical variable using a median split. The recipients' implicit and explicit attitudes were then subjected to a 2-way ANOVA with the sources' median split explicit attitudes as a fixed factor and the sources' implicit attitudes as a covariate. In this case, the sources' implicit and explicit attitudes showed no significant effect on the recipients' explicit attitude, but the sources' explicit attitude did have a marginal effect on the recipients' implicit attitude, controlling for the sources' implicit attitude, $F(1,35) = 3.671$, $p < 0.065$ (see Figure 13). This effect is in the expected direction, so negative explicit attitudes in the source lead to negative implicit attitudes in the recipient (M = -0.693, SD = 0.3), and positive explicit attitudes lead to slightly less negative attitudes in the recipient (M = -0.509, SD = 0.313), but the effect size was very small ($\eta^2 = 0.095$).

Discussion

In this study, the procedure to independently influence the sources' implicit and explicit attitudes was the same as in Study 2, with only two meaningful

differences. First, the behaviors attributed to the source were modified to be less extreme and more coherent (more plausibly committed by a college-aged White male). Second, the participants anticipated interacting with the target after forming an impression of him, rather than anticipating describing the target to another person, and this can cause people to spend more time and cognitive effort on individuating information when forming the impression (Neuberg & Fiske, 1987).

These differences, either together or singularly, caused a change in the attitudes the sources formed towards the target. Although the *behaviors* and not the *primes* were changed between the studies, the effect was on the sources' *implicit* attitudes, not on the sources' explicit attitudes.

The effect of the behaviors on the explicit attitudes was consistent across experiments and with expectations. When the sources categorized positive behaviors as characteristic of the target, they formed a positive explicit attitude towards him, and vice-versa. This effect was somewhat attenuated in Study 3 compared to Study 2, but this was expected, as the behaviors were less extreme in Study 3.

The effect of the manipulation on the implicit attitudes, as mentioned, was quite different. In this study, participants in every condition formed negative implicit attitudes towards the source *except* those who categorized negative behaviors and saw negative primes, which one might expect to be the most likely condition to form *negative* attitudes towards the target. This differed from Study 2 and from Rydell and colleagues' (2006) study. What seems to be certain,

however, is that the primes did not have the predicted effect, and the behaviors had a surprising reverse effect on the sources' implicit attitudes when prior work suggested otherwise.

Nevertheless, despite the fact that the procedure did not affect the implicit and explicit attitudes independently as expected, it was still possible to examine the effect of the sources' attitudes towards the target on the recipients' perception of the target. However, it appears that watching the video of the source interacting with the target was not enough to influence the recipients' attitudes towards the target. The sources' implicit attitudes did not influence the recipients' implicit or explicit attitudes towards the target, and the sources' explicit attitudes did not have an effect on the recipients' explicit attitudes. There was a very small effect of the sources' explicit attitudes on the recipients' implicit attitudes, such that sources with positive attitudes caused the recipients to have a more positive implicit attitude towards the target.

General Discussion

The three studies reported here attempted to determine if a person's implicit attitude has an influence independent from the person's explicit attitudes on another person's attitudes. Using various techniques and in various situations, the implicit and explicit attitudes of a source of influence towards a target person were measured or manipulated, a recipient was given the opportunity to be influenced by the source, and the effect on the recipient's attitudes towards the target was measured.

In the first study, the sources' attitudes toward President Bush were measured, and they were asked to deliver a pro-Bush and an anti-Bush speech, which were videotaped. After measuring the recipients' attitudes toward President Bush, they watched one of these videotapes, and the change in their attitudes was measured. In line with standard persuasion studies, the direction of the speech affected the change in the recipients' explicit attitudes towards Bush. Additionally, when only looking at those sources that had non-neutral implicit attitudes, the sources' implicit attitude affected the change in the recipients' explicit attitude, but not in the expected direction, so those sources with positive implicit attitudes towards Bush caused the recipients to become explicitly more negative towards Bush, and vice-versa.

For Studies 2 and 3, we borrowed a paradigm from Rydell and colleagues (2006) to independently manipulate the sources' explicit and implicit attitudes towards a target person. In this paradigm, participants categorized behaviors as characteristic or not characteristic of the target, and received feedback indicating that only positive or only negative behaviors were characteristic of the target. Simultaneously, positive or negative primes were subliminally presented prior to the picture of the target. Surprisingly, the manipulation did not entirely work the way we expected. In both studies, the corrective feedback in the categorization task had the predicted effect on the sources' explicit attitudes. When the participants learned that positive behaviors were characteristic of Bob they formed positive explicit attitudes towards Bob, and vice-versa. However, in Study 2 it was the behaviors rather than the primes that influenced the sources'

implicit attitudes, such that when positive behaviors were characteristic of the target it led to negative implicit attitudes, while negative behaviors led to more positive implicit attitudes.

In Study 2, the sources then communicated their newly formed impressions to the recipient. The effect of the behaviors on the sources' explicit attitudes appears to have been so strong as to cause the sources' explicit attitudes to overwhelm any other source of influence on the recipient. The recipients' explicit attitudes were highly correlated with the sources' explicit attitudes, indicating the sources effectively communicated their impression. One surprising result was that the sources' explicit attitudes negatively influenced the recipients' implicit attitudes just as the behaviors negatively influenced the sources' implicit attitudes. It seems that the behaviors may have been so overpowering that they affected both the implicit and explicit attitude of the source, and affected the explicit attitude of the source so much that it affected both the implicit and explicit attitudes of the recipient.

In Study 3, the behaviors being categorized as characteristic of the target were less extreme and more plausibly could have come from one person. This change was implemented so that the participants would believe the person they were about to meet actually performed the behaviors they categorized as characteristic of him, and to reduce the possibility that the effect of the behaviors was overwhelming the effect of the primes. This change had the expected effect on the sources' explicit attitudes; corrective feedback that indicated positive behaviors were characteristic of the target led to positive explicit attitudes and

vice-versa, but the effect of the behaviors was attenuated, so the attitudes of the sources were less extreme. However, the effect of the manipulation on the sources' *implicit* attitudes was yet again different from predictions. In Study 3 there was an interaction between the primes and the behaviors, such that negative primes and negative behaviors led to relatively positive or neutral implicit attitudes towards the target, while all other combinations of primes and behaviors led to negative implicit attitudes.

As opposed to Study 2, in which the sources directly communicated their impression to the recipients, the recipients in Study 3 formed their impression of the target by watching a videotape of the source interact with the target. However, it seems that this was not sufficient to convey the sources' impression of the target. There was almost no effect of the sources' attitudes on the recipients' explicit ratings or measures of their implicit attitudes. There was one very small effect such that the recipients' implicit attitudes were positively correlated with the source's explicit attitudes. The target, a confederate, also seemed unable to detect either the implicit or the explicit attitudes of the source.

It is worth noting that the only situation in which we discovered an influence of a source's implicit attitudes was when those attitudes were pre-existing rather than recently developed (Study 1). It is possible that the method used to induce implicit attitudes in Studies 2 and 3, while sufficient to affect responses on a speeded-judgment task such as the IAT, was unable to affect participants' automatic evaluations sufficiently to guide their nonverbal behavior in detectable ways.

It is also notable that Study 1 showed that a situation exists in which the source's implicit attitudes influences the recipient. Although the support for the main hypothesis was weak throughout the three studies reported here, it accomplished at the very least a proof of concept, that a person's implicit attitude can have an independent influence on another person's attitudes. This influence was contrastive rather than assimilative in the first study, and the mechanism underlying this deserves further research.

Finally, the consistent yet puzzling pattern of contrastive influence across the three studies is worth noting. In Study 2, the target's behaviors had a reverse effect on the sources' implicit attitude. In Study 3, however, it was the *primes* that had a reverse effect on the sources' implicit attitudes. In Study 1, the recipients' explicit attitudes were contrasted away from the sources' implicit attitudes. In Study 2, however, it was the recipients' *implicit* attitudes that were contrasted away from the sources' *explicit* attitudes. It is not clear whether there is some common thread underlying these results or what that common thread would be, but future research should bear in mind these unusual outcomes.

There are at least two future lines of research suggested by the work presented here. First, it would be useful to further delineate the situations in which a person's implicit attitude has an effect on someone else that is independent from the person's explicit attitude. A natural first step is to study the situation in which the source has pre-existing attitudes towards a target (as in Study 1) and the recipient observes the source interacting with the target (as in Study 3). Considering that we found independent influence in a situation in which the

source had pre-existing attitudes, and that previous research has witnessed implicit attitudes guiding nonverbal behavior in situations in which the source is interacting with the target (Dovidio, Kawakami, & Gaertner, 2002; Greenwald et al., 1998), it seems that this situation might be the most likely to reveal the independent influence of implicit attitudes.

It is also possible that the sources' implicit attitude affected apects of the recipients' attitude, such as their attitude certainty, which we did not measure in these studies. Changes in certainty would have consequences for future persuasion attempts (Petrocelli, Tormala, & Rucker, 2007; Tormala & Petty, 2002) and the stability of the attitude over time, which could be detected by seeing whether recipients are more influenced by subsequent persuasion attempts that were congruent with the sources' implicit (but not explicit) attitudes.

It might also be useful to simplify the situation and make the attitude object something other than a person. Edwards (1990) induced oppositely valenced cognitively and affectively based attitudes towards a sports drink by providing positive or negative information about the drink, and then having participants taste the drink, which was either pleasant or unpleasant. A procedure similar to this could be used to induce opposite implicit and explicit attitudes towards a drink, and the source could either try to persuade another person to choose the drink over another one, or the recipient could watch the source tasting the drink, or both, before choosing between it and another drink.

It is also possible that people would have pre-existing, oppositely valenced implicit and explicit attitudes towards non-social objects. Nosek (2007) surveyed

a large range of attitude objects and measured the correlations between implicit and explicit attitudes. He found that certain objects, such as pants and skirts, had relatively low implicit-explicit correlations, and it may therefore be more likely that some people will have opposing implicit and explicit attitudes towards these objects. Also, Friese, Wänke, and Plessner (2006) found that when people had confliciting implicit and explicit attitudes towards a product, their choices correlated with their implicit attitudes when under time pressure, but accorded more with their explicit attitudes when given time to deliberate.

When the situations in which a person's implicit attitudes have an independent influence on a recipient of social influence have been more substantially explored, it would be necessary to explore the mechanisms underlying the influence. In the first study, when we observed an influence of implicit attitudes it was contrastive rather than assimilative. It is possible this is because the implicit attitudes of the source were misperceived as certainty, rather than an attitude that was independent of the attitude they were expressing in the speech. Additionally, some extra variable that may be correlated with implicit attitudes, such as the likeability of the speaker, could be causing the effect, but this was not possible to disambiguate because Study 1 was a correlational study. Perhaps if the recipients were made aware that the sources might not believe the words they were speaking, emphasizing that the sources were required to read the speech as part of the experiment, the recipients may attend more to the nonverbal behaviors of the source and thereby be more influenced by them.

Another means to emphasize the "hidden" attitude of the source would be to have recipients observe the source giving the pro- or counter-attitudinal message without sound, to focus the recipients on the nonverbal behaviors (c.f., Dovidio et al., 1997). It would be very interesting if the implicit attitudes had a contrastive influence when the message could be heard, but an assimilative effect when only the nonverbal information was available.

Another line of research suggested by the work presented here is to refine the methods used to induce opposing implicit and explicit attitudes. In the second study, the procedure borrowed from Rydell and colleagues (2006) produced surprising results. It appears as though the repetitive categorization of positive or negative behaviors as characteristic of a target was sufficient to create explicit attitudes that were congruent with the behaviors and implicit attitudes that were incongruent with the behaviors. In the second study, no effect of the primes was found. In the third study, the effect of the behaviors was attenuated, and the primes now influenced the sources' attitudes. On the explicit measure, the effect was straightforward – negative behaviors led to negative explicit attitudes, and (particularly with the positive behaviors) negative primes led to more negative explicit attitudes. On the implicit measure, the effect was much more difficult to interpret, and merits further exploration.

A natural extension would be to replicate the procedure from Study 2 and 3 with a neutral or no prime condition, and with neutral behaviors, changing it to a 3 (positive, neutral, negative primes) x 3 (negative, neutral, positive behaviors) design, to see if the effect of the behaviors on the implicit measure replicates. If

the behaviors continued to have an opposite effect on the participants' implicit attitudes, it would require a theoretical explanation that at present seems to be lacking. Previous research on evaluative conditioning (Olson & Fazio, 2001; Staats & Staats, 1958) has shown a change in a person's attitudes congruent with the unconditioned stimulus. It is surprising, therefore, to observe an influence that is opposite the valence of the learned information on an implicit measure of attitudes. This is especially so, as some research has shown conditioning effects *only* when the participant is aware of the contingency between the unconditioned stimulus (in this case, the behaviors) and the conditioned stimulus (the target) (Allen & Janiszewski, 1989; Insko & Oakes, 1966).

Additionally, most work on impression formation shows the intuitive result that the valence of the traits or behaviors attributed to a person matches the valence of the impression of the person (Anderson, 1989; Asch, 1946; E. R. Smith & Zaraté, 1992). However, to the author's knowledge, there has been no test of a person's implicit attitudes subsequent to the serial presentation of behaviors in an impression formation task.

Nevertheless, these effects resemble the findings of Skowronski, Carlston, and Isham (1993), in which they covertly presented half of the participants with a trait label, and overtly presented half of the participants with the same negative trait label ("retarded"). They found that those participants who were only overtly presented with the label recalled slightly more trait-incongruent behaviors than trait-congruent behaviors, and rated the target more positively, indicating a sort of contrast effect with the explicit presentation. Those participants who only saw the

covert presentation of the trait label, however, rated the target more negatively and remembered more stereotype-congruent behaviors. Interestingly, however, those who saw both the covert trait label and the overt trait label rated the participant highest and recalled the most stereotype-incongruent behaviors.

This study used explicit measures and focused on impression formation rather than attitudes towards the target, but their work is at least parallel evidence for differing effects of explicit and implicit presentations on impression formation, and shows contrastive effects with explicit presentation. Skowronski and colleagues (1993) attribute the contrast effects to explicit comparisons between the trait label and the behaviors, which were not always congruent and therefore led to contrasted impressions. However, it is possible that the sources in our experiment may have explicitly accepted the behaviors as attributed to the target, but implicitly doubted it, leading to implicit ambivalence (Petty et al., 2006).

Additionally, the effects of the behaviors on the source's implicit attitudes could be akin to the "reverse priming" effect reported by (Glaser & Banaji, 1999). They noted that while moderate primes (e.g., *pillow*) led to the standard finding of facilitation of targets with the same valence, extreme primes (e.g., *triumph*) led to facilitation of oppositely valenced targets. Thus, on an implicit attitude measure, moderate primes were automatically associated with the same valenced targets, but extreme primes were automatically associated with oppositely valenced targets. In fact, the primes from the Rydell, et al (2006) study used in Study 2 and Study 3 seem more like the extreme primes than the moderate primes in Glaser and Banaji's study. Although only one word was used in both studies ("friend",

which Glaser and Banaji rated as extreme), and without rating the primes from the Rydell study it is impossible to know for sure, the effect on the sources' implicit attitudes suggest a similar contrast process may have been in action. In other words, because the target was paired with extreme primes, the target may have become associated with the opposite valence of the primes, and therefore the target facilitated the oppositely valenced pairings in the IAT. This remains a topic for future research.

Overall, the studies reported here provide suggestive evidence that the methods used to simultaneously create implicit and explicit attitudes in a person can be refined and improved. Additionally, based on previous work and the work reported here, it seems prudent to thoroughly test the behavioral consequences of attitudes formed through these techniques. Finally, and most importantly, these studies provided evidence that a source's implicit attitude can influence another person's attitudes, although the circumstances in which this happens are still unclear, and deserve further research attention. The contrastive effect of the sources' implicit attitudes on the recipients' explicit attitudes in Study 1 also warrants further research, as it has implications for research on social influence more generally.

References

Abelson, R. P., & Prentice, D. A. (1989). Beliefs as possessions: A functional perspective. In. Hillsdale, NJ, England: Lawrence Erlbaum Associates, Inc.

Ajzen, I., & Fishbein, M. (1977). Attitude-behavior relations: A theoretical analysis and review of empirical research. *Psychological Bulletin, 84*(5), 888-918.

Allen, C. T., & Janiszewski, C. A. (1989). Assessing the Role of Contingency Awareness in Attitudinal Conditioning with Implications for Advertising Research. *Journal of Marketing Research, 26*(1), 30-43.

Anderson, N. H. (1989). Functional memory and on-line attribution. In. Hillsdale, NJ, England: Lawrence Erlbaum Associates, Inc.

Asch, S. E. (1946). Forming impressions of personality. *Journal of Abnormal & Social Psychology, 41*(3), 258-290.

Asch, S. E. (1951). Effects of group pressure upon the modification and distortion of judgments. In. Oxford, England: Carnegie Press.

Asendorpf, J. B., Banse, R., & Mücke, D. (2002). Double dissociation between implicit and explicit personality self-concept: The case of shy behavior. *Journal of Personality and Social Psychology, 83*(2), 380-393.

Bailenson, J. N., & Yee, N. (2005). Digital Chameleons. *Psychological Science, 16*(10), 814-819.

Bandura, A., Ross, D., & Ross, S. A. (1963). Imitation of film-mediated aggressive models. *The Journal of Abnormal and Social Psychology, 66*(1), 3-11.

Bargh, J. A. (1994). The four horsemen of automaticity: Awareness, intention, efficiency, and control in social cognition. In. Hillsdale, NJ, England: Lawrence Erlbaum Associates, Inc.

Bargh, J. A., & Pietromonaco, P. (1982). Automatic information processing and social perception: The influence of trait information presented outside of conscious awareness on impression formation. *Journal of Personality and Social Psychology, 43*(3), 437-449.

Bem, D. J. (1970). Beliefs, attitudes, and human affairs. *Oxford, England: Brooks/Cole, 114*.

Bessenoff, G. R., & Sherman, J. W. (2000). Automatic and controlled components of prejudice toward fat people: Evaluation versus stereotype activation. *Social Cognition, 18*(4), 329-353.

Breckler, S. J. S. (1984). Empirical validation of affect, behavior, and cognition as distinct components of attitude. *Journal of personality and social psychology, 47*(6), 1191-1205.

Brown, B. B., Clasen, D. R., & Eicher, S. A. (1986). Perceptions of peer pressure, peer conformity dispositions, and self-reported behavior among adolescents. *Developmental Psychology, 22*(4), 521-530.

Burgoon, J. K., Birk, T., & Pfau, M. (1990). Nonverbal Behaviors, Persuasion, and Credibility. *Human Communication Research, 17*(1), 140-169.

Cacioppo, J. T., Gardner, W. L., & Berntson, G. G. (1997). Beyond Bipolar Conceptualizations and Measures: The Case of Attitudes and Evaluative Space. *Personality & Social Psychology Review, 1*(1), 3.

Campbell, D. T. (1950). The indirect assessment of social attitudes. *Psychological Bulletin, 47*(1), 15-38.

Carli, L. L., LaFleur, S. J., & Loeber, C. C. (1995). Nonverbal behavior, gender, and influence. *Journal of Personality and Social Psychology, 68*(6), 1030-1041.

Carver, C. S., & Scheier, M. F. (1978). Self-focusing effects of dispositional self-consciousness, mirror presence, and audience presence. *Journal of Personality and Social Psychology, 36*(3), 324-332.

Chartrand, T. L., & Bargh, J. A. (1999). The chameleon effect: The perception-behavior link and social interaction. *Journal of Personality and Social Psychology, 76*(6), 893-910.

Chassin, L., Presson, C., Rose, J., Sherman, S. J., & Prost, J. (2002). Parental Smoking Cessation and Adolescent Smoking. *J. Pediatr. Psychol., 27*(6), 485-496.

Chen, M., & Bargh, J. A. (1999). Consequences of Automatic Evaluation: Immediate Behavioral Predispositions to Approach or Avoid the Stimulus. *Pers Soc Psychol Bull, 25*(2), 215-224.

Cialdini, R. B., Petty, R. E., & Cacioppo, J. T. (1981). Attitude and Attitude Change. *Annual Review of Psychology, 32*(1), 357-404.

Crandall, C. S. (1994). Prejudice against fat people: Ideology and self-interest. *Journal of Personality and Social Psychology, 66*(5), 882-894.

Crusco, A. H., & Wetzel, C. G. (1984). The Midas Touch: The Effects of Interpersonal Touch on Restaurant Tipping. *Pers Soc Psychol Bull, 10*(4), 512-517.

Cunningham, W. A., Zelazo, P. D., Packer, D. J., & Van Bavel, J. J. (in press). The iterative reprocessing model: A multi-level framework for attitudes and evaluation. *Social Cognition*.

Dasgupta, N., & Greenwald, A. G. (2001). On the malleability of automatic attitudes: Combating automatic prejudice with images of admired and disliked individuals. *Journal of Personality and Social Psychology, 81*(5), 800-814.

Deutsch, M., & Gerard, H. B. (1955). A study of normative and informational social influences upon individual judgment. *The Journal of Abnormal and Social Psychology, 51*(3), 629-636.

Devine, P. G. (1989). Stereotypes and prejudice: Their automatic and controlled components. *Journal of Personality and Social Psychology, 56*(1), 5-18.

Dovidio, J. F., Gaertner, S. E., Kawakami, K., & Hodson, G. (2002). Why can't we just get along? Interpersonal biases and interracial distrust. *Cultural Diversity & Ethnic Minority Psychology, 8*(2), 88-102.

Dovidio, J. F., Kawakami, K., & Gaertner, S. L. (2002). Implicit and explicit prejudice and interracial interaction. *Journal of Personality and Social Psychology, 82*(1), 62-68.

Dovidio, J. F., Kawakami, K., Johnson, C., Johnson, B., & Howard, A. (1997). On the Nature of Prejudice: Automatic and Controlled Processes. *Journal of Experimental Social Psychology, 33*(5), 510-540.

Dutton, D. G., & Aron, A. P. (1974). Some evidence for heightened sexual attraction under conditions of high anxiety. *Journal of Personality and Social Psychology, 30*(4), 510-517.

Eagly, A. H., & Chaiken, S. (1993). The psychology of attitudes. *Orlando, FL, US: Harcourt Brace Jovanovich College Publishers, 794*.

Edwards, K. (1990). The interplay of affect and cognition in attitude formation and change. *Journal of Personality and Social Psychology, 59*(2), 202-216.

Fazio, R. H. (1990). Multiple processes by which attitudes guide behavior: The MODE model as an integrative framework. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 23, pp. 75-109). San Diego, CA, US: Academic Press.

Fazio, R. H. (in press). Attitudes as object-evaluation associations of varying strength, *Social Cognition*.

Fazio, R. H., Chen, J.-m., McDonel, E. C., & Sherman, S. J. (1982). Attitude accessibility, attitude-behavior consistency, and the strength of the object-evaluation association. *Journal of Experimental Social Psychology, 18*(4), 339-357.

Fazio, R. H., Jackson, J. R., Dunton, B. C., & Williams, C. J. (1995). Variability in automatic activation as an unobstrusive measure of racial attitudes: A

bona fide pipeline? *Journal of Personality and Social Psychology, 69*(6), 1013-1027.

Fazio, R. H., & Olson, M. A. (2003). Implicit Measures in Social Cognition Research: Their Meaning and Use. *Annual Review of Psychology, 54*(1), 297-327.

Fazio, R. H., Sanbonmatsu, D. M., Powell, M. C., & Kardes, F. R. (1986). On the automatic activation of attitudes. *Journal of Personality and Social Psychology, 50*(2), 229-238.

Fazio, R. H., & Towles-Schwen, T. (1999). The MODE model of attitude-behavior processes. In. New York, NY, US: Guilford Press.

Gawronski, B. (in press). Attitudes can be measured! But what is an attitude?, *Social Cognition*.

Gawronski, B., & Bodenhausen, G. V. (2006). Associative and Propositional Processes in Evaluation: An Integrative Review of Implicit and Explicit Attitude Change. *Psychological Bulletin, 132*(5), 692-731.

Gawronski, B., & Bodenhausen, G. V. (in press). Unraveling the processes underlying evaluation: Attitudes from the perspective of the APE model, *Social Cognition*.

Gawronski, B., & Strack, F. (2004). On the propositional nature of cognitive consistency: Dissonance changes explicit, but not implicit attitudes. *Journal of Experimental Social Psychology, 40*(4), 535-542.

Glaser, J., & Banaji, M. R. (1999). When fair is foul and foul is fair: Reverse priming in automatic evaluation. *Journal of Personality and Social Psychology, 77*(4), 669-687.

Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: Attitudes, self-esteem, and stereotypes. *Psychological Review, 102*(1), 4-27.

Greenwald, A. G., Klinger, M. R., & Liu, T. J. (1989). Unconscious processing of dichoptically masked words. *Memory & Cognition, 17*(1), 35-47.

Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology, 74*(6), 1464-1480.

Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the Implicit Association Test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology, 85*(2), 197-216.

Gregg, A. P., Seibt, B., & Banaji, M. R. (2006). Easier done than undone: Asymmetry in the malleability of implicit preferences. *Journal of Personality and Social Psychology, 90*(1), 1-20.

Hamilton, D. L., & Sherman, S. J. (1996). Perceiving persons and groups. *Psychological Review, 103*(2), 336-355.

Hass, R. G. (1981). Effects of source characteristics on cognitive responses and persuasion. In R. E. Petty, T. M. Ostrom & T. C. Brock (Eds.), *Cognitive responses in persuasion* (pp. 141-172). Hillsdale, NJ: Lawrence Erlbaum.

Herr, P. M., Sherman, S. J., & Fazio, R. H. (1983). On the consequences of priming: Assimilation and contrast effects. *Journal of Experimental Social Psychology, 19*(4), 323-340.

Hovland, C. I., Janis, I. L., & Kelley, H. H. (1953). Communication and persuasion; psychological studies of opinion change. *New Haven, CT, US: Yale University Press, 315*.

Insko, C. A., & Oakes, W. F. (1966). Awareness and the "Conditioning" of Attitudes. *Journal of Personality and Social Psychology, 4*(5), 487-496.

Jones, E. E., & Sigall, H. (1971). The bogus pipeline: A new paradigm for measuring affect and attitude. *Psychological Bulletin, 76*(5), 349-364.

Kaplan, M. F., & Miller, C. E. (1987). Group decision making and normative versus informational influence: Effects of type of issue and assigned decision rule. *Journal of Personality and Social Psychology, 53*(2), 306-313.

Kelman, H. C. (1961). Processes of Opinion Change. *The Public Opinion Quarterly, 25*(1), 57-78.

Kerpelman, J. P., & Himmelfarb, S. (1971). Partial-reinforcement effects in attitude acquisition and counter-conditioning. *Journal of Personality & Social Psychology, 19*(3), 301.

Kim, D.-Y. (2003). Voluntary Controllability of the Implicit Association Test (IAT). *Social Psychology Quarterly, 66*(1), 83-96.

LaFrance, M. (1979). Nonverbal Synchrony and Rapport: Analysis by the Cross-Lag Panel Technique. *Social Psychology Quarterly, 42*(1), 66-70.

LaPiere, R. T. (1934). Attitudes vs. Actions. *Social Forces, 13*(2), 230-237.

Likert, R. (1932). A technique for the measurement of attitudes. *Archives of Psychology, 22 No. 140,* 55.

Lombardi, W. J., Higgins, E. T., & Bargh, J. A. (1987). The Role of Consciousness in Priming Effects on Categorization: Assimilation Versus Contrast as a Function of Awareness of the Priming Task. *Pers Soc Psychol Bull, 13*(3), 411-429.

Lowery, B. S., Hardin, C. D., & Sinclair, S. (2001). Social influence effects on automatic racial prejudice. *Journal of Personality and Social Psychology, 81*(5), 842-855.

Mason, W. A., Conrey, F. R., & Smith, E. R. (2007). Situating Social Influence Processes: Dynamic, Multidirectional Flows of Influence Within Social Networks. *Personality and Social Psychology Review, 11*(3), 279-300.

McClelland, J. L., & Rumelhart, D. E. (1985). Distributed memory and the representation of general and specific information. *Journal of Experimental Psychology: General, 114*(2), 159-188.

McConahay, J. B., Hardee, B. B., & Batts, V. (1981). Has Racism Declined in America? It Depends on Who Is Asking and What Is Asked. *The Journal of Conflict Resolution, 25*(4), 563-579.

McConnell, A. R., & Leibold, J. M. (2001). Relations among the Implicit Association Test, Discriminatory Behavior, and Explicit Measures of Racial Attitudes. *Journal of Experimental Social Psychology, 37*(5), 435-442.

Mehrabian, A. (1967). Orientation Behaviors and Nonverbal Attitude Communication. *Journal of Communication, 17*(4), 324-332.

Milgram, S. (1963). Behavioral Study of obedience. *The Journal of Abnormal and Social Psychology, 67*(4), 371-378.

Murphy, S. T., & Zajonc, R. B. (1993). Affect, cognition, and awareness: Affective priming with optimal and suboptimal stimulus exposures. *Journal of Personality and Social Psychology, 64*(5), 723-739.

Neuberg, S. L., & Fiske, S. T. (1987). Motivational influences on impression formation: Outcome dependency, accuracy-driven attention, and individuating processes. *Journal of Personality and Social Psychology, 53*(3), 431-444.

Nosek, B. A. (2001). The go/no-go association task. *Social Cognition, 19*(6), 625.

Nosek, B. A. (2007). Implicit-Explicit Relations. *Current Directions in Psychological Science, 16*(2), 65-69.

Olson, M. A., & Fazio, R. H. (2001). Implicit Attitude Formation Through Classical Conditioning. *Psychological Science, 12*(5), 413.

Olson, M. A., & Fazio, R. H. (2006). Reducing Automatically Activated Racial Prejudice Through Implicit Evaluative Conditioning. *Pers Soc Psychol Bull, 32*(4), 421-433.

Osgood, C. E., Suci, G. J., & Tannenbaum, P. H. (1957). The measurement of meaning. *Champaign, IL, US: University of Illinois Press*.

Patterson, M. L. (1986). Touch, compliance, and interpersonal affect. *Journal of nonverbal behavior, 10*(1), 41.

Payne, B. K., Cheng, C. M., Govorun, O., & Stewart, B. D. (2005). An inkblot for attitudes: Affect misattribution as implicit measurement. *Journal of Personality and Social Psychology, 89*(3), 277-293.

Petrocelli, J. V., Tormala, Z. L., & Rucker, D. D. (2007). Unpacking Attitude Certainty: Attitude Clarity and Attitude Correctness. *Journal of Personality and Social Psychology, 92*(1), 30-41.

Petty, R. E., & Cacioppo, J. T. (1984). The effects of involvement on responses to argument quantity and quality: Central and peripheral routes to persuasion. *Journal of Personality and Social Psychology, 46*(1), 69-81.

Petty, R. E., & Cacioppo, J. T. (1996). Attitudes and persuasion: Classic and contemporary approaches. *Boulder, CO, US: Westview Press, 314*.

Petty, R. E., Tormala, Z. L., Briñol, P., & Jarvis, W. B. G. (2006). Implicit ambivalence from attitude change: An exploration of the PAST model. *Journal of Personality and Social Psychology, 90*(1), 21-41.

Plant, E. A., & Devine, P. G. (1998). Internal and external motivation to respond without prejudice. *Journal of Personality and Social Psychology, 75*(3), 811-832.

Pratto, F., Sidanius, J., Stallworth, L. M., & Malle, B. F. (1994). Social dominance orientation: A personality variable predicting social and political attitudes. *Journal of Personality and Social Psychology, 67*(4), 741-763.

Ridgeway, C. L. (1987). Nonverbal Behavior, Dominance, and the Basis of Status in Task Groups. *American Sociological Review, 52*(5), 683-694.

Rydell, R. J., McConnell, A. R., Mackie, D. M., & Strain, L. M. (2006). Of Two Minds: Forming and Changing Valence-Inconsistent Implicit and Explicit Attitudes. *Psychological Science, 17*(11), 954-958.

Scheflen, A. E. (1964). The significance of posture in communication systems. *Psychiatry, 27*, 316-331.

Schneider, W., & Shiffrin, R. M. (1977). Controlled and automatic human information processing: I. Detection, search, and attention. *Psychological Review, 84*(1), 1-66.

Schooler, T. Y. (1990). Do Discrepant Attitude Components Become Consistent Over Time. *Unpublished master's thesis*.

Schwarz, N. (in press). Attitude construction: Evaluation in context, *Social Cognition*.

Schwarz, N., & Bohner, G. (2001). The construction of attitudes. In A. Tesser & N. Schwarz (Eds.), *Blackwell handbook of social psychology: Intraindividual processes* (pp. 436-457). Malden, MA: Blackwell Publishers.

Sinclair, S., Lowery, B. S., Hardin, C. D., & Colangelo, A. (2005). Social Tuning of Automatic Racial Attitudes: The Role of Affiliative Motivation. *Journal of Personality and Social Psychology, 89*(4), 583-592.

Skowronski, J. J., Carlston, D. E., & Isham, J. T. (1993). Implicit Versus Explicit Impression Formation: The Differing Effects of Overt Labeling and Covert Priming on Memory and Impressions. *Journal of Experimental Social Psychology, 29*(1), 17-41.

Smith, E. R. (1996). What do connectionism and social psychology offer each other? *Journal of Personality and Social Psychology, 70*(5), 893-912.

Smith, E. R., & Conrey, F. R. (2007). Mental Representations Are States, Not Things: Implications for Implicit and Explicit Measurement. In. New York, NY, US: Guilford Press.

Smith, E. R., & DeCoster, J. (2000). Dual-Process Models in Social and Cognitive Psychology: Conceptual Integration and Links to Underlying Memory Systems. *Personality and Social Psychology Review, 4*(2), 108-131.

Smith, E. R., & Zaraté, M. A. (1992). Exemplar-based model of social judgment. *Psychological Review, 99*(1), 3-21.

Smith, F. J. (1977). Work attitudes as predictors of attendance on a specific day. *Journal of Applied Psychology, 62*(1), 16-19.

Snyder, M., & Swann, W. B. (1976). When actions reflect attitudes: The politics of impression management. *Journal of Personality and Social Psychology, 34*(5), 1034-1042.

Solarz, A. K. (1960). Latency of instrumental responses as a function of compatibility with the meaning of eliciting verbal signs. *Journal of Experimental Psychology, 59*(4), 239-245.

Staats, A. W., & Staats, C. K. (1958). Attitudes established by classical conditioning. *The Journal of Abnormal and Social Psychology, 57*(1), 37-40.

Strack, F., & Deutsch, R. (2004). Reflective and Impulsive Determinants of Social Behavior. *Personality & Social Psychology Review, 8*(3), 220-247.

Strack, F., Schwarz, N., Bless, H., Kübler, A., & Wänke, M. (1993). Awareness of the influence as a determinant of assimilation versus contrast. *European Journal of Social Psychology, 23*(1), 53-62.

Thurstone, L. L. (1928). Attitudes Can Be Measured. *The American Journal of Sociology, 33*(4), 529-554.

Tormala, Z. L., & Petty, R. E. (2002). What doesn't kill me makes me stronger: The effects of resisting persuasion on attitude certainty. *Journal of Personality and Social Psychology, 83*(6), 1298-1313.

van Baaren, R. B., Holland, R. W., Steenaert, B., & van Knippenberg, A. (2003). Mimicry for money: Behavioral consequences of imitation. *Journal of Experimental Social Psychology, 39*(4), 393-398.

von Hippel, W., Sekaquaptewa, D., & Vargas, P. (1997). The Linguistic Intergroup Bias As an Implicit Indicator of Prejudice. *Journal of Experimental Social Psychology, 33*(5), 490-509.

Wicker, A. W. (1969). Attitudes versus actions: The relationship of verbal and overt behavioral responses to attitude objects. *Journal of Social Issues. Vol., 25*(4), 41-78.

Wilson, T. D., & Hodges, S. D. (1992). Attitudes as temporary constructions. In. Hillsdale, NJ, England: Lawrence Erlbaum Associates, Inc.

Wilson, T. D., Lindsey, S., & Schooler, T. Y. (2000). A model of dual attitudes. *Psychological Review, 107*(1), 101-126.

Wilson, T. D., & Schooler, J. W. (1991). Thinking too much: Introspection can reduce the quality of preferences and decisions. *Journal of Personality and Social Psychology, 60*(2), 181-192.

Winkielman, P., Berridge, K. C., & Wilbarger, J. L. (2005). Unconscious Affective Reactions to Masked Happy Versus Angry Faces Influence Consumption Behavior and Judgments of Value. *Pers Soc Psychol Bull, 31*(1), 121-135.

Woodall, W. G., & Burgoon, J. K. (1981). The effects of nonverbal synchrony on message comprehension and persuasiveness. *Journal of Nonverbal Behavior, 5*(4), 207-223.

Zanna, M. P., & Rempel, J. K. (1988). Attitudes: A new look at an old concept. In. New York, NY, US: Cambridge University Press.

Appendix A

Explicit attitude measure from Study 1

Please rate your agreement with these statements on the following scale:

1 – strongly disagree; 2 – disagree; 3 – slightly disagree

4 – neither agree nor disagree (or both agree and disagree)

5 – slightly agree; 6 – agree; 7 – strongly agree

1. I *(dis)*approve of the way President Bush is handling his job as president.

2. I have an *(un)*favorable opinion of President Bush.

3. President Bush is *(dis)*honest and *(un)*trustworthy.

4. President Bush is a *(weak)* strong and *(in)*decisive leader.

5. President Bush can*(not)* manage government effectively.

6. George W. Bush's presidency has been a *(failure)* success.

7. President Bush's remaining years in office will be a *(failure)* success.

8. President Bush *(does not have)* has the personality and leadership qualities a president should have.

9. I *(dis)*agree with President Bush on the issues that matter to me.

10. President Bush is *(in)*capable of handling a crisis.

11. President Bush *(does not care)* cares about the needs of people like me.

12. President Bush *(does not share)* shares my values.

Appendix B

Speeches read by sources in Study 1

Pro-Bush speech:

George W. Bush's presidency has been a success domestically and internationally. His reaction to 9/11 was swift and decisive, and our country is safer now than it was before he took office.

President Bush cares about our nation's relationship with other countries. Under his leadership, the Iraqi military is gaining new capabilities and new confidence, and the Iraqi people have made strides toward becoming a democracy.

The President also cares about the citizens of his own country. His "No Child Left Behind" Act has instituted higher standards for education, and national test scores are on the rise. The Administration has also provided more Pell Grants for higher education so that more students can afford to attend college.

President Bush's economic plan has stimulated the economy to steadily gain jobs in every month since May 2003. His tax cuts have put more money in the hands of working people. Nationally, productivity is growing at the fastest rate in nearly 40 years, and new housing construction continues at a record pace.

In conclusion, President Bush is a strong, decisive, and thoughtful leader who has strengthened our safety, increased our prosperity, and garnered respect at home and abroad.

Anti-Bush speech:

George W. Bush's presidency has been a failure domestically and internationally. His policies since 9/11 turned tremendous world sympathy toward the U.S. into tremendous international resentment for the Administration's policies, and he has yet to fulfill his pledge to capture Osama bin Laden 'dead or alive.'

President Bush does not care about our nation's relationship with other countries. In a search for weapons of mass destruction that were never found, he attacked a sovereign nation against the will of the United Nations and world community.

The President also does not care about the citizens of his own country. His "No Child Left Behind" Act has encouraged teachers to teach to the test and decreased the quality of education in the U.S. The Administration even cut healthcare benefits for war veterans.

President Bush's economic plan caused over 2 million Americans to lose their jobs in his first two years in office. He cut the government's income through his tax cuts while simultaneously setting the record for the biggest annual budget spending increases and bankrupting all 50 state governments.

In conclusion, President Bush is a thoughtless, nationalistic leader who has endangered Americans, decreased their prosperity, and lost respect at home and abroad.

Appendix C

Explicit attitude measure from Study 2

kind cruel

1------2------3------4------5------6------7------8------9

bad good

1------2------3------4------5------6------7------8------9

mean pleasant

1------2------3------4------5------6------7------8------9

uncaring caring

1------2------3------4------5------6------7------8------9

likeable unlikable

1------2------3------4------5------6------7------8------9

agreeable disagreeable

1------2------3------4------5------6------7------8------9

Appendix D

Behaviors used to form impression of target in Study 3

Positive Behaviors

always says good moring with a big grin on his face
avoided other people in order not to give his cold to them
bought a friend a potted plant on Valentine's Day
bought a neighborhood child a balloon at the fair
bought an old guitar and fixed it up for his cousin
built a bookcase for his new apartment
built a stained glass lamp shade for his sister's wedding present
bought all of his friends a drink at the bar
cooked a nice dinner for his friends
donated a pint of blood to the Red Cross
gave $20 to the United Way Campaign
gave his seat on the bus to an older person
gave directions to a driver who was lost
had a surprise party for his father's birthday
helped a foreign student locate a place to live
helped a friend learn how to swim
helped a friend move into an apartment
helped a friend repaint his apartment
helped a friend review for a test
helped a lost child find his way home
helped a neighbor child draw a picture
helped a wheelchair patient up a ramp
helped a young child learn the alphabet
gave food to a homeless person
helped in an activity program for handicapped children
helped some neighboring campers set up their tent
lent a friend his new sleeping bag and tent to go camping
lent money to a friend in financial difficulty
let an older person get in front of him in a grocery checkout line
offered to share an umbrella with a stranger during a downpour
pulled off the highway to assist a driver whose car had stalled
rode his bike to work every day to cut down on pollution and gas consumption
rushed to the aid of someone who fell off their bicycle
saves cans and bottles for recycling
sent flowers to his mother on Mother's Day
shut a neighbor's door when they accidentally left it open
spent his day off helping his mother around the house
taught a neighbor child how to ride a bike
tells those close to him that he loves them
told a woman that she had dropped her wallet
told the proprietor of a small store that she had given him too much change
took care of the neighbor's pets while they were gone
tries to give someone a ride whenever he is driving a long distance
turns in his assignments on time
typed a manuscript for a friend
volunteers one day a week to work for the child care center
went to the hospital to visit his friend
works 40 hours a week in an effort to pay for school
writes his parents at least once every two weeks
wrote letters to his congressperson supporting equal rights for all

Negative Behaviors

always asks his friends distracting and irrelevant questions
borrowed some CDs from an acquaintance and never returned them
broke a lamp at a party and later denied responsibility
broke his friends guitar because he was angry
butted into the front of a long line at a movie theater
called in sick for work when he was well
cheated during a poker game
cheated on a take-home exam from the university
closed his door in the face of someone collecting donations
cheated on his girlfriend
defaced a large rock with spray paint in a public park
demanded immediate service from the salesman
dented another car in a parking lot and refused to leave his name
derided his girlfriend at a party
did not show up for a prearranged tennis game
did not thank a friend for a generous birthday gift
drove his car down a residential street at 70 mph
found a good watch in a park and pawned it
got drunk and insulted everybody at a cocktail party
had his driver's license suspended for drunken driving
had someone else take a math final for him
had someone else write a term paper for him
intentionally spread gossip about an acquaintance
left a burner on when leaving his home
left no tip for the waiter
made fun of lesbians on the street
parked his car in a space that was marked for a disabled person
played his record player loudly late at night
puts down anyone in a conversation who disagrees with him
ran into a parked car while driving under the influence of alcohol
refused to go out to dinner with 2 friends when they chose a restaurant not to his liking
refused to lend a friend a book he needed for a paper
refused to sign a petition to improve playground facilities for school children
set off a fire alarm as a practical joke
shouted and honked at another driver on the street
interrupted a class to answer his phone
stole a book from the college book store
stole a parking place by driving into it from behind while someone else was backing into it
stole merchandise from his work
talked loudly on his cell phone in a restaurant
threw a chair through a window at a party
told a lie about his friend
told the host and hostess of a party that their taste in furniture was horrible
turned in someone else's class project under his own name
walked out of a restaurant without paying the bill
was apprehended when trying to steal candy from corner grocery store
was fined $500 for littering at a National Park
witnessed a car accident, but didn't report it
yelled at a waitress for being too slow
yelled at his grandma when she wouldn't lend him money

Appendix E

Explicit attitude measure from Study 3

Please rate your agreement with these statements on the following scale:

1 – strongly disagree; 2 – disagree; 3 – slightly disagree

4 – neither agree nor disagree (or both agree and disagree)

5 – slightly agree; 6 – agree; 7 – strongly agree

1. The discussion with the participant went very smoothly. _____

2. I liked the participant. _____

3. The participant liked me. _____

4. The participant was very friendly. _____

5. I felt comfortable with the participant. _____

6. I felt the participant was comfortable with me. _____

Figure Captions

Figure 1. Pictorial representation of the affective misattribution procedure (AMP; Payne, et. al, 2005) used in Study 1

Figure 2. Scatterplot of the a) sources' and b) recipients' explicit (abscissa) and implicit (ordinate) attitudes, Study 1.

Figure 3. Change in recipients' explicit attitudes as a function of the direction of the source's speech, Study 1. Error bars show ±1 standard error.

Figure 4. Change in recipients' implicit attitudes as a function of the sources' implicit attitudes, Study 1. Only sources with non-neutral attitudes are shown. Speech direction is illustrated by the shading of the crosses, and regression lines are fit to the total and the subgroups.

Figure 5. Sources' a) explicit and b) implicit attitudes as a function of the behaviors and primes in the impression formation task, Study 2. Error bars show ±1 standard error.

Figure 6. Scatterplot of the a) sources' and b) recipients' explicit (abscissa) and implicit (ordinate) attitudes, Study 2. The shape denotes the behaviors learned by the source and the shading denotes the primes seen by the source.

Figure 7. Recipients' explicit attitude as a function of the sources' implicit attitudes and (median split) explicit attitudes, Study 2.

Figure 8. Recipients' implicit attitudes as a function of the source's (median-split) explicit attitudes, Study 2. Error bars show ±1 standard error.

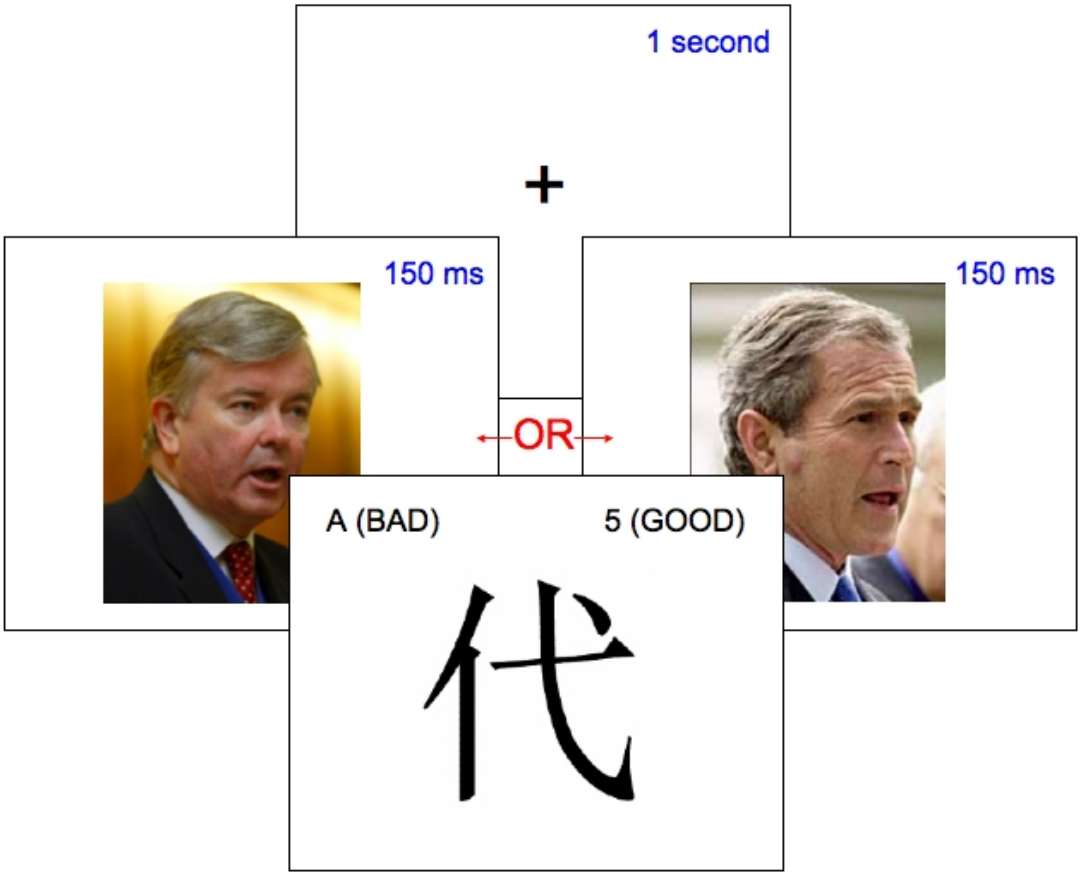
Figure 9. A still from a video watched by recipients in Phase II of Study 3. The target (a confederate) has been covered with a picture of himself, so only the source's behavior can be seen.

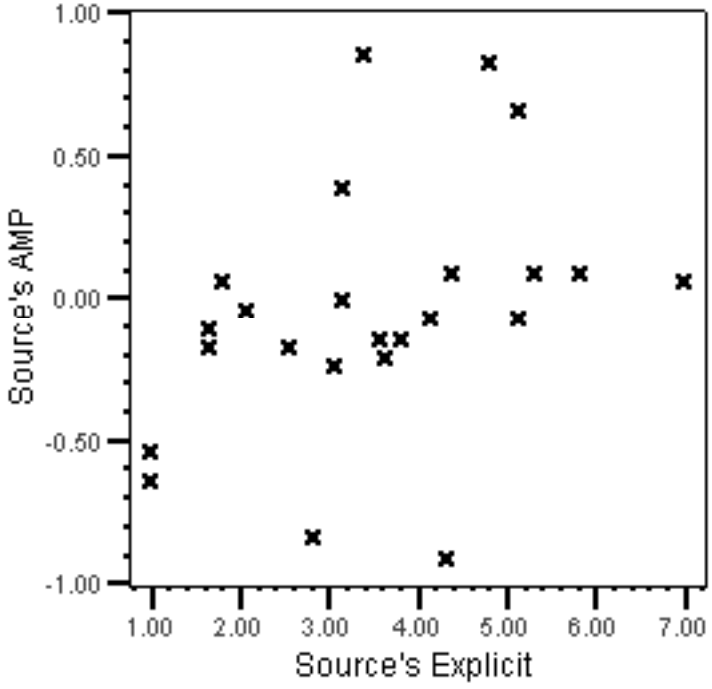
Figure 10. Sources' a) explicit and b) implicit attitudes as a function of the behaviors and primes in the impression formation task, Study 3. Error bars show ±1 standard error.

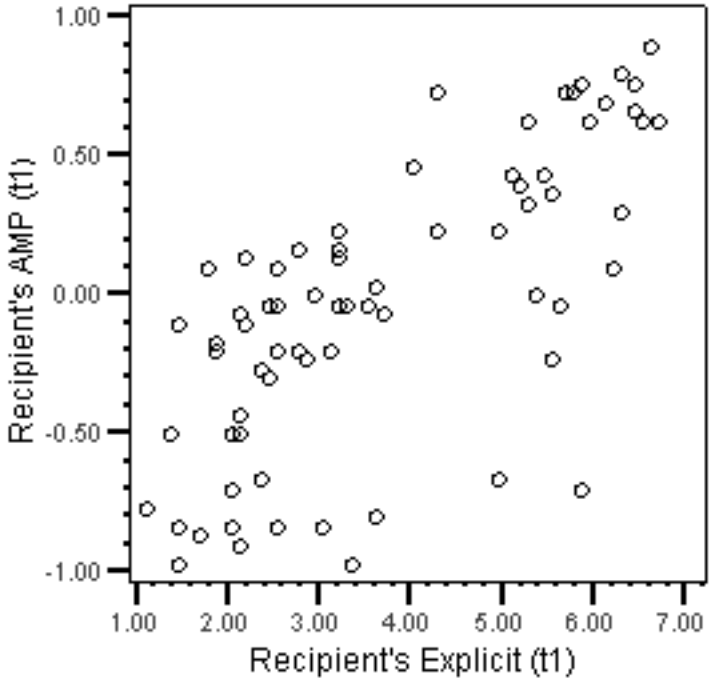
Figure 11. Effect of primes on sources' implicit attitudes in Study 2 and Study 3.

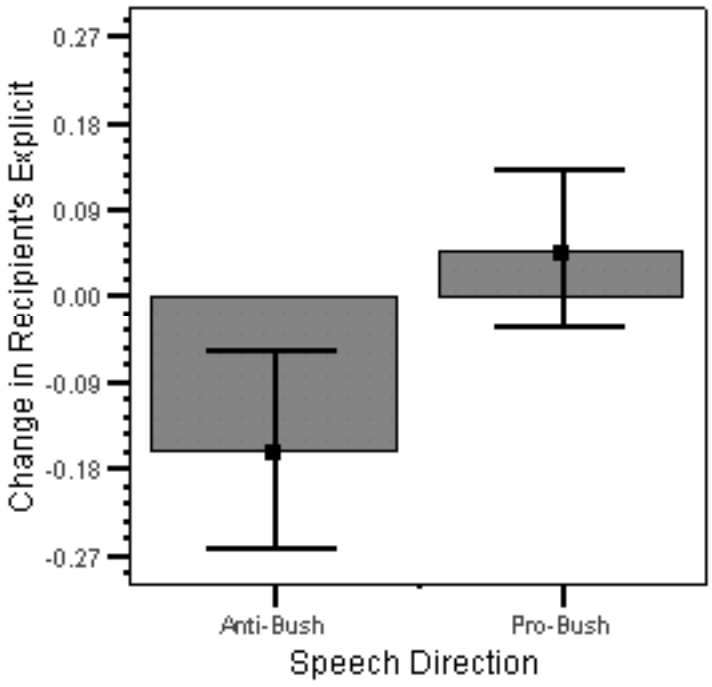
Figure 12. Scatterplot of the a) sources' and b) recipients' explicit (abscissa) and implicit (ordinate) attitudes, Study 3. The shape denotes the behaviors learned by the source and the shading denotes the primes seen by the source.

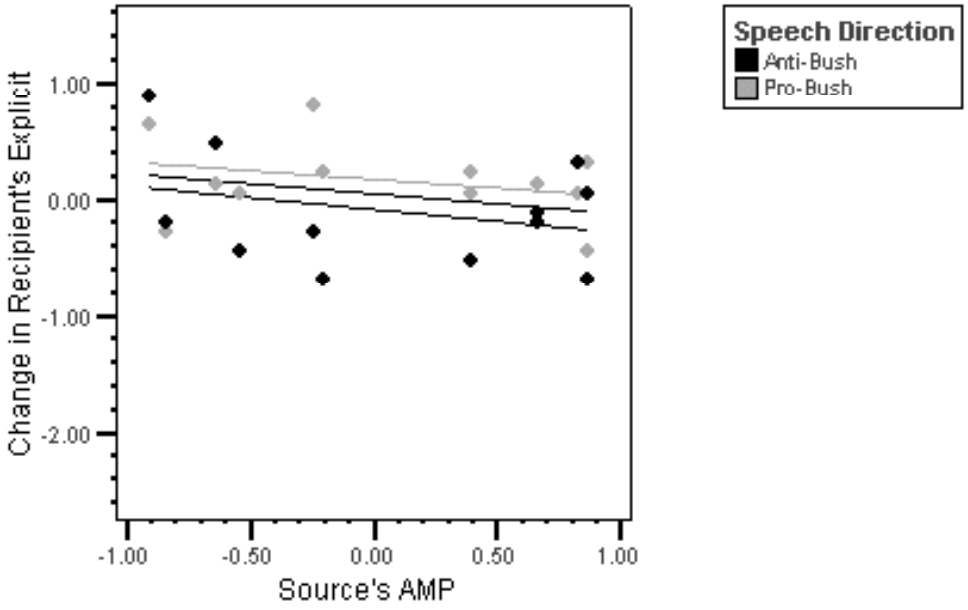
Figure 13. Recipients' implicit attitudes as a function of the sources' (median split) explicit attitudes. Error bars show ±1 standard error.

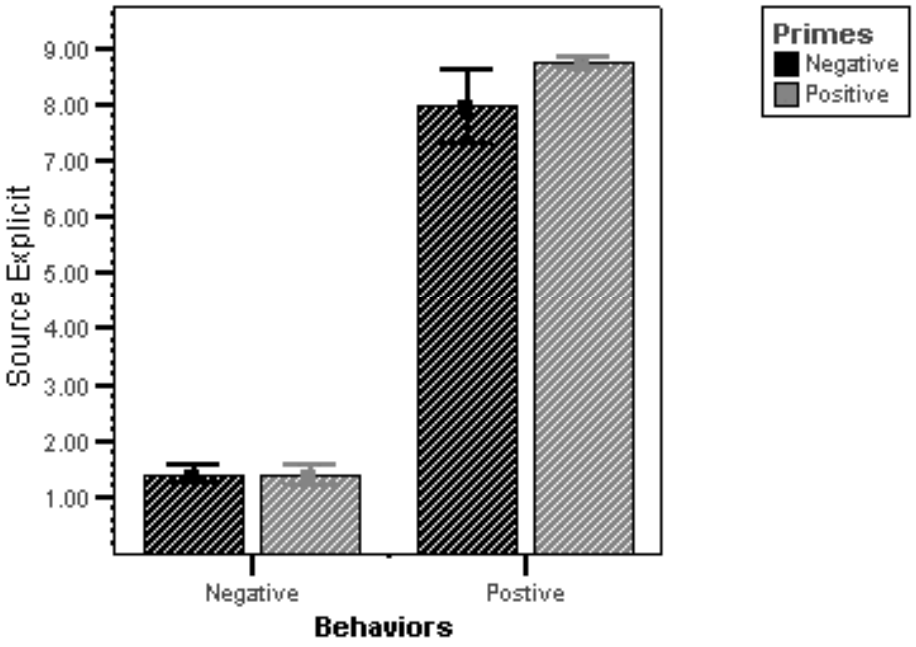

1 second
+
150 ms
OR
150 ms
A (BAD)
5 (GOOD)
代

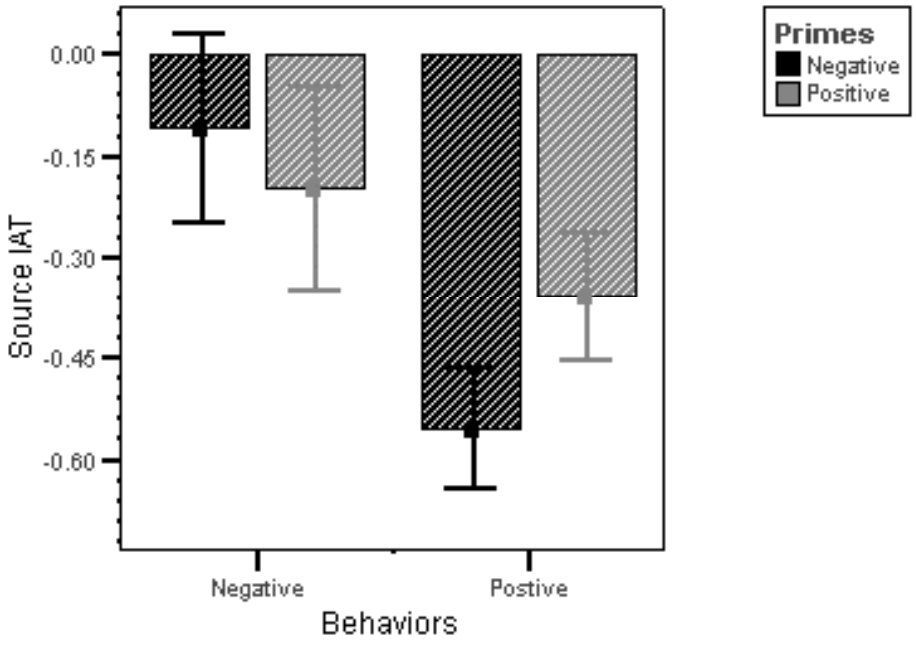

1.00
0.50
0.00
-0.50
-1.00
Source's AMP
1.00
2.00
3.00
4.00
5.00
6.00
7.00
Source's Explicit

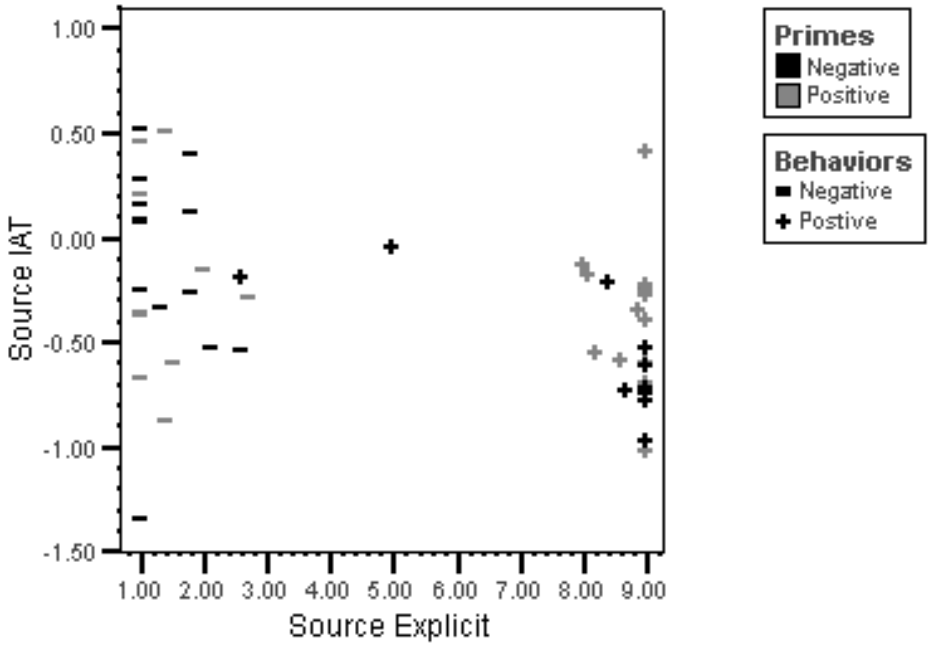

1.00
0.50
0.00
-0.50
-1.00
Recipient's AMP (t1)
1.00
2.00
3.00
4.00
5.00
6.00
7.00
Recipient's Explicit (t1)

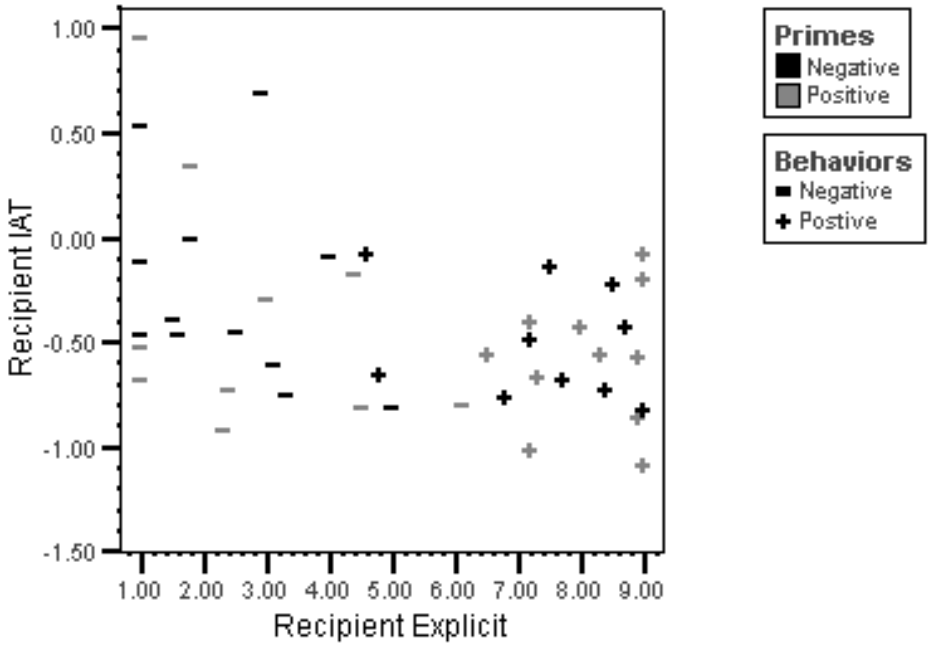

0.27
0.18
0.09
0.00
-0.09
-0.18
-0.27
Change in Recipient's Explicit
Anti-Bush
Pro-Bush
Speech Direction

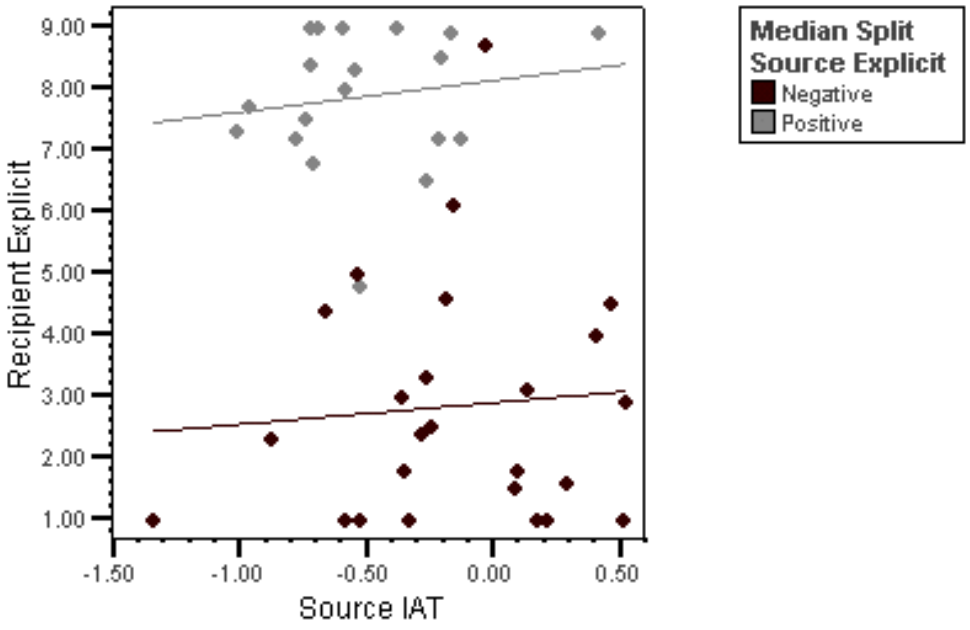

Speech Direction
Anti-Bush
Pro-Bush
Change in Recipient's Explicit
1.00
0.00
-1.00
-2.00
-1.00
-0.50
0.00
0.50
1.00
Source's AMP

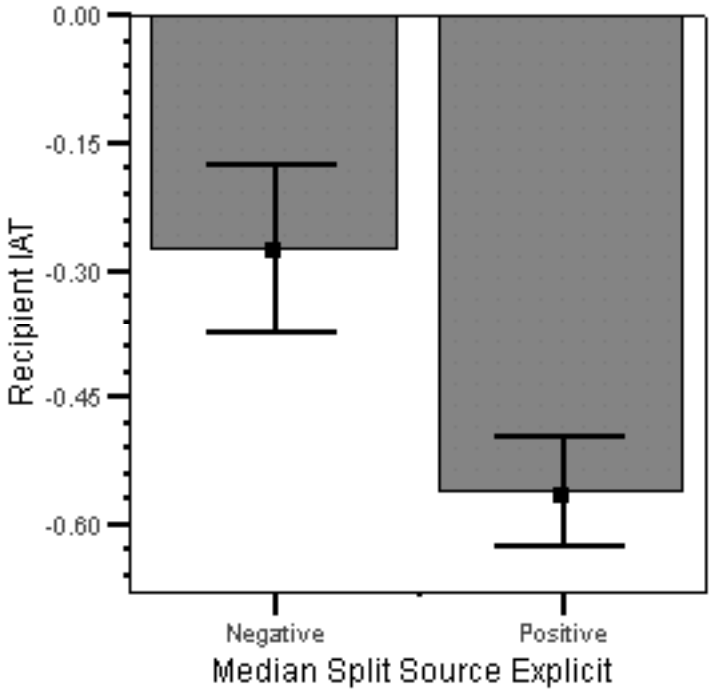

Primes
Negative
Positive
Source Explicit
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
Negative
Postive
Behaviors

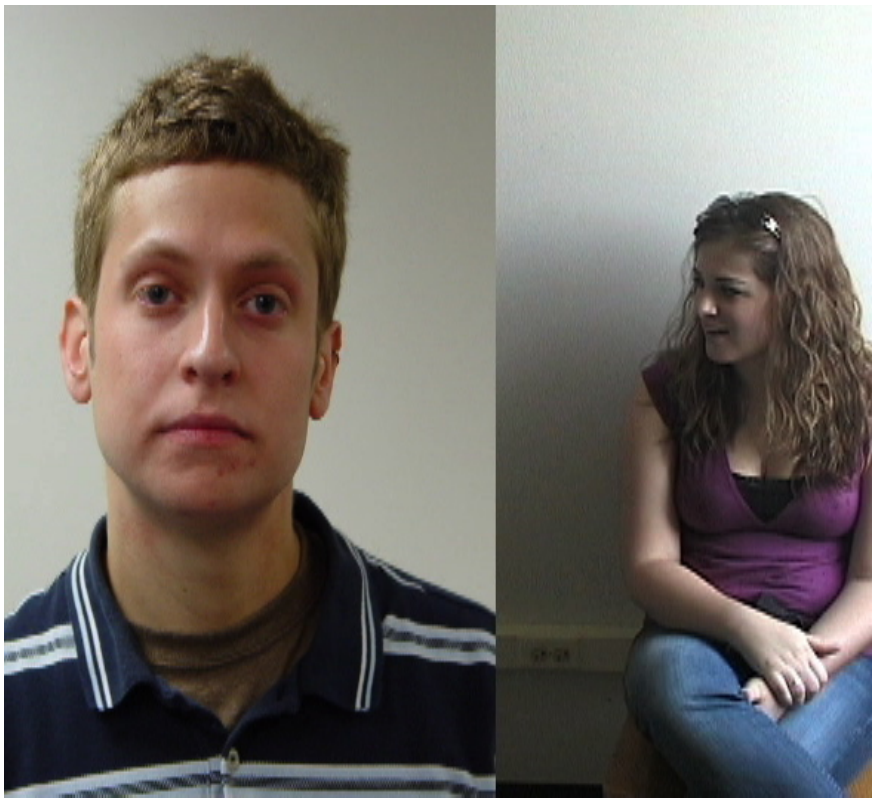

Primes
Negative
Positive
Source IAT
0.00
-0.15
-0.30
-0.45
-0.60
Negative
Postive
Behaviors

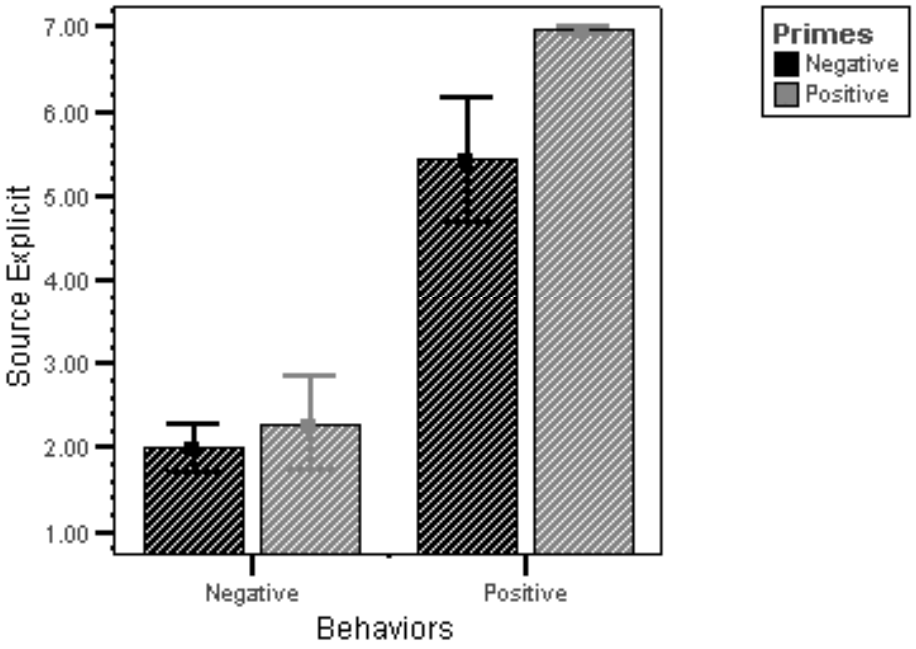

Source IAT
1.00
0.50
0.00
-0.50
-1.00
-1.50
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00
Source Explicit
Primes
Negative
Positive
Behaviors
Negative
Postive

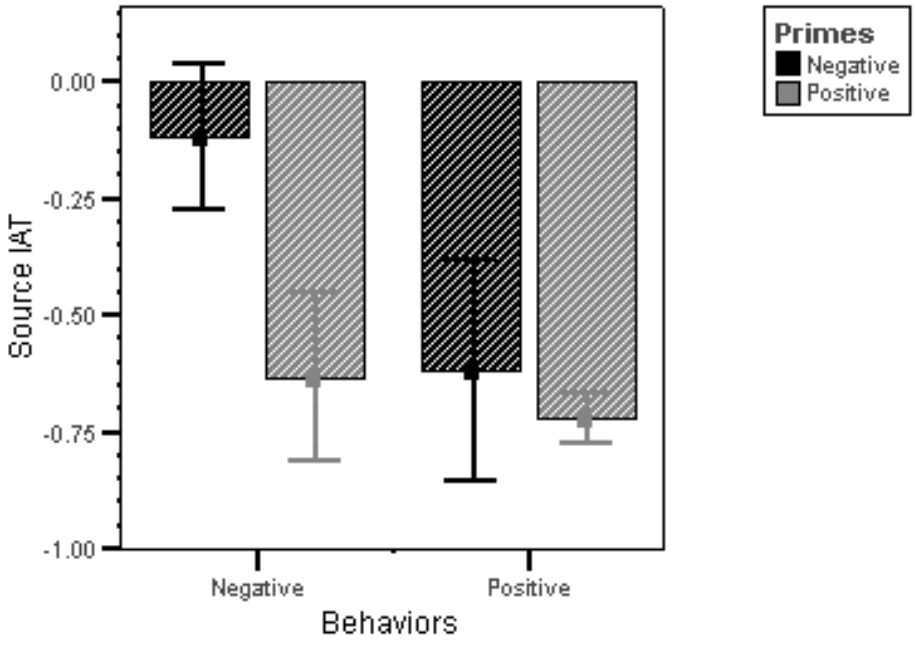

Recipient IAT
1.00
0.50
0.00
-0.50
-1.00
-1.50
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00
Recipient Explicit
Primes
Negative
Positive
Behaviors
Negative
Postive

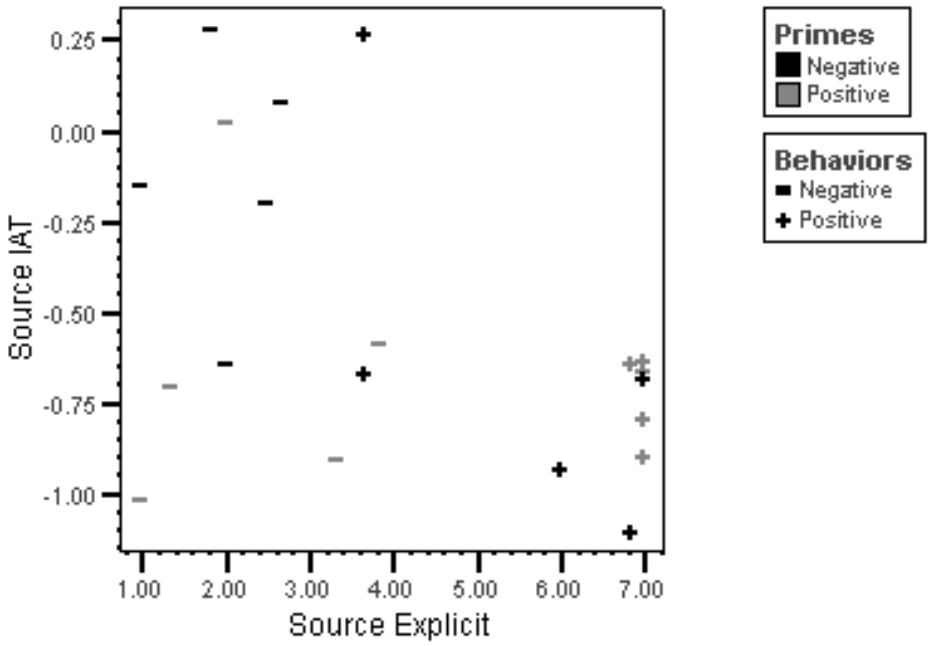

Median Split
Source Explicit
Negative
Positive
Recipient Explicit
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
-1.50
-1.00
-0.50
0.00
0.50
Source IAT

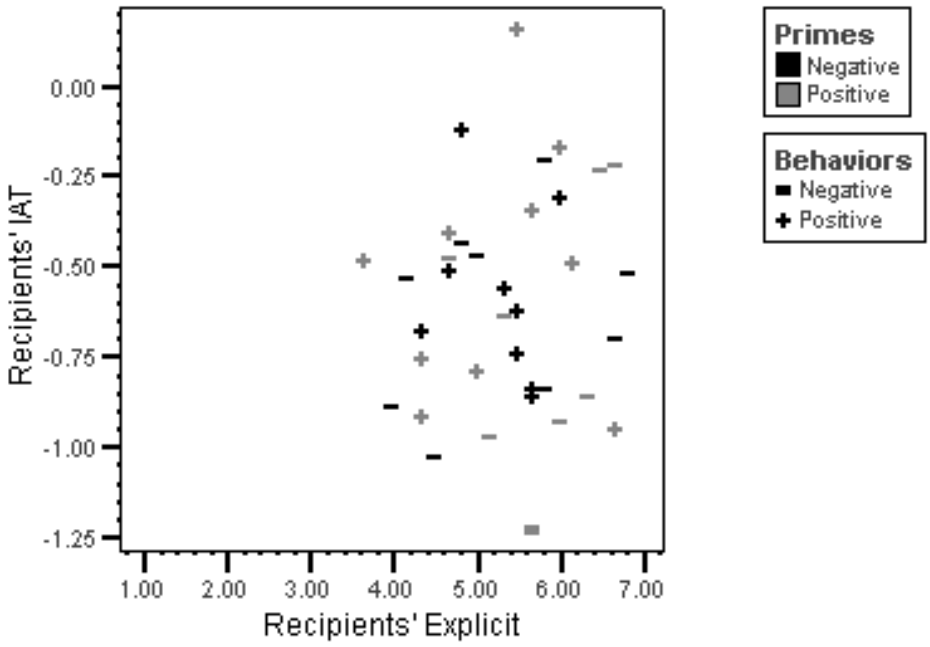

0.00
-0.15
-0.30
-0.45
-0.60
Recipient IAT
Negative
Positive
Median Split Source Explicit

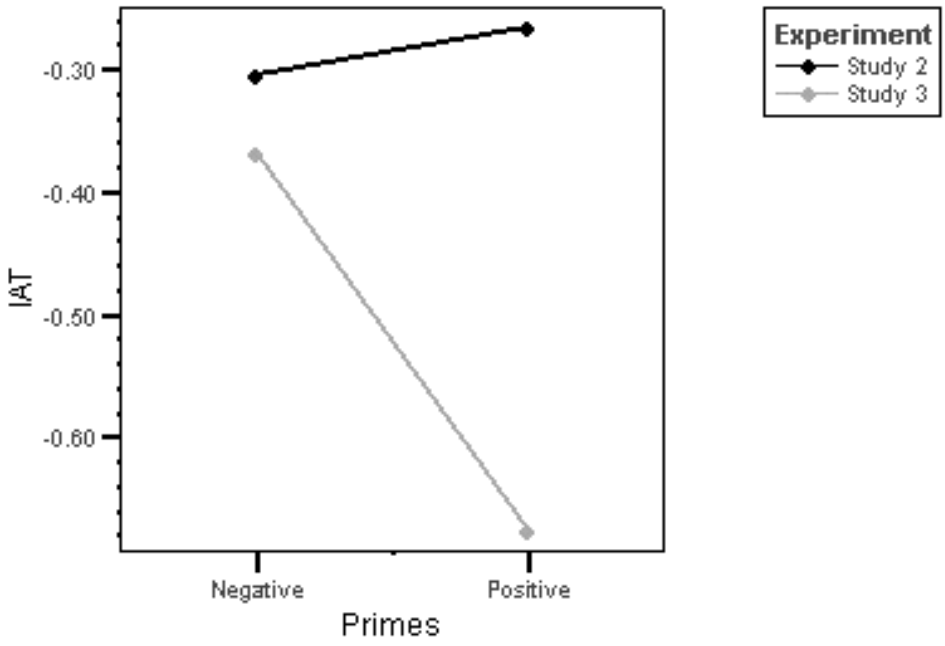


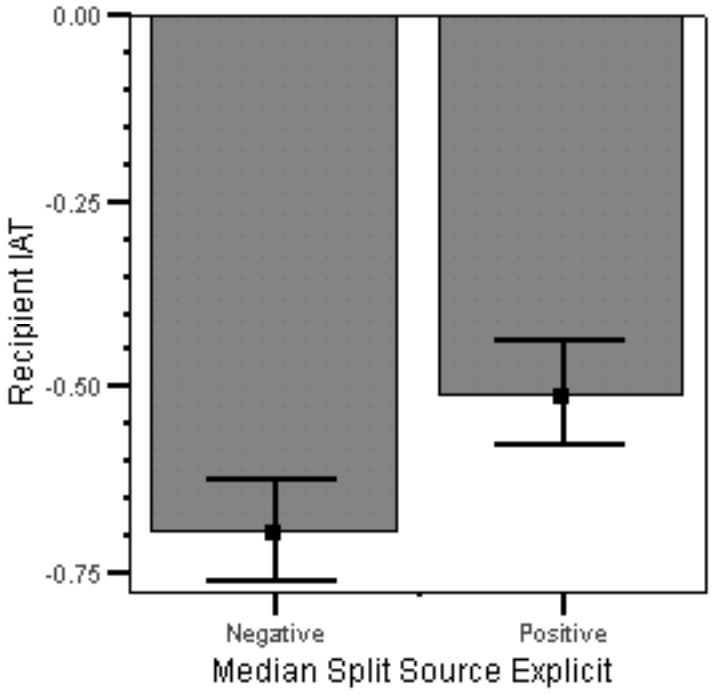

Primes
Negative
Positive
Source Explicit
7.00
6.00
5.00
4.00
3.00
2.00
1.00
Negative
Positive
Behaviors


Primes
Negative
Positive
Source IAT
0.00
-0.25
-0.50
-0.75
-1.00
Negative
Positive
Behaviors


Primes
Negative
Positive
Behaviors
Negative
Positive
Source IAT
0.25
0.00
-0.25
-0.50
-0.75
-1.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
Source Explicit


Primes
Negative
Positive
Behaviors
Negative
Positive
Recipients' IAT
0.00
-0.25
-0.50
-0.75
-1.00
-1.25
1.00
2.00
3.00
4.00
5.00
6.00
7.00
Recipients' Explicit


Experiment
Study 2
Study 3
-0.30
-0.40
-0.50
-0.60
IAT
Negative
Positive
Primes


0.00
-0.25
-0.50
-0.75
Recipient IAT
Negative
Positive
Median Split Source Explicit

Curriculum Vitae

Winter Mason

Department of Psychological and Brain Sciences
Indiana University, 1101 E. 10th St., Bloomington, IN 47405
Phone: (812) 856-1350 email: wimason@indiana.edu

Research Interests

My research interests bridge multiple levels of the study of human behavior. The center of focus of my research is social psychology, but I employ methodologies and theories from cognitive science, network science, and cognitive psychology. My current foci are on social networks in social psychology and the influence of implicit attitudes on targets of persuasion. Ultimately, I hope to move science towards a theory of social behavior that integrates research from anthropology, sociology, economics, psychology, and cognitive science.

Education

University of Pittsburgh
B.S. in Psychology, 1999
Cum Laude

Indiana University
Ph.D. in Social Psychology and Cognitive Science, August 2007
Committee: Eliot R. Smith, Robert L. Goldstone, Zakary Tormala, Olaf Sporns

Honors and Fellowships

2002 Cognitive Science Fellowship
2005 Travel Award from the Cognitive Science Society
2006 Best Conference Poster Award (2nd place): International Workshop and Conference on Network Science

Teaching and Research Experience

2002 *Teaching Assistant: Computational and Statistical Models in Psychology*
Held office hours weekly, graded homework assignments and exams.

2003 *Teaching Assistant: Advanced Statistics in Psychology*
Taught a lab section every other week and graded homework assignments and exams.

2004 *Lab Instructor: Introduction to Psychology for Majors I*
Designed syllabus and created materials for hands-on instruction of basic psychology concepts.

Manuscripts in Preparation

Mason, W., Jones, A. & Goldstone, R. L. (revising for requested resubmission). Propagation of Innovations in Networked Groups. *Journal of Experimental Psychology: General*

Publications

Queller, S., & **Mason, W.** (in press). A Decision Bound Categorization Approach to the Study of Subtyping of Atypical Group Members. *Social Cognition*

Goldstone, R. L., Roberts, M. E., **Mason, W.**, & Gureckis, T. (in press). Collective search in concrete and abstract spaces. In T. Kugler, C. Smith, and T. Connelly (Eds.) Decision modeling and behavior in uncertain and complex environments. Springer Press.

Mason, W., Conrey, F. R., & Smith, E. R. (2007). Situating social influence processes: Dynamic, multidirectional flows of influence within social networks. *Personality and Social Psychology Review, 11(3),* 279-300.

Queller, S., Schell, T. & **Mason, W.** (2006). A novel view of between-category contrast and within-category assimilation. *Journal of Personality and Social Psychology, 91(3), 406-422.*

Professional Presentations

Mason, W. & Berger, J. (2007) *A Computational Model of Tastes as Signals of Group Identity.* Poster at annual meeting of the Society for Personality and Social Psychology, 2007

Mason, W. & Smith, E. R. (2007) *The Influence of Private Attitudes Independent of the Public Message.* Poster at annual meeting of the Society for Personality and Social Psychology, 2006

Mason, W., Jones, A. & Goldstone, R. L. (2006) *Propagation of Innovations in Networked Groups.* Poster at International Workshop and Conference on Network Science, 2006

Mason, W., Jones, A. & Goldstone, R. L. (2006) *Propagation of Innovations in Networked Groups.* Poster at the annual meeting of the Society for Personality and Social Psychology, 2006

Mason, W., Jones, A. & Goldstone, R. L. (2005). *Propagation of Innovations in Networked Groups.* Talk given at 27th annual meeting of the Cognitive Science Society.

Queller, S. & **Mason, W.** (2003). *Supervised and unsupervised learning lead to biases in perceptions of category attributes.* Talk presented to Social Psychologists of Indiana, Lafayette, IN.

Professional Affiliations

American Psychological Association
Cognitive Science Society
Society of Personality and Social Psychology
International Network for Social Network Analysis

Service

Cognitive Science Representative, Graduate and Professional Student Organization
Programming Committee Chair, Graduate and Professional Student Organization

References available upon request