

## Policy Implications of Implicit Social Cognition

**Brian A. Nosek\* and Rachel G. Riskind**

*University of Virginia*

*Basic research in implicit social cognition demonstrates that thoughts and feelings outside of conscious awareness or conscious control can influence perception, judgment, and action. Implicit measures reveal that people possess implicit attitudes and stereotypes about social groups that are often distinct from their explicitly endorsed beliefs and values. The evidence that behavior can be influenced by implicit social cognition contrasts with social policies that assume that people know and control the causes of their behavior. We consider the present state of evidence for implicit social cognition and its implications for social policy. We conclude that consideration of implicit social cognition can improve policy, and that most policy use of implicit measures as selection or evaluation devices is not easily justified.*

Two revelations from the mind sciences are easy to understand about other people's minds yet difficult to accept about one's own: (1) much of mental life occurs outside of conscious awareness and conscious control, and (2) thinking is often not objective or rational. Minds use shortcuts, heuristics, inferences, stereotypes, and expectations to help comprehend what happened before and predict what will happen next. These processes can be useful and effective on one occasion and suboptimal or plain wrong on another. Moreover, they can influence social perception, judgment, and behavior implicitly—without the person's awareness or control.

If this implicit social cognition was merely a quirky feature of the mind's internal dialogue, with no implications for perceptions, judgments, or actions, then it would have little relevance for social policy. Social policies are principles,

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\*Correspondence concerning this article should be addressed to Brian Nosek, Box 400400; 102 Gilmer Hall, Department of Psychology, University of Virginia, Charlottesville, VA 22904-4400. Tel: 434-924-0666 [e-mail: nosek@virginia.edu].

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guidelines, and legislation that affect human welfare. Such policies rarely address how humans think; rather, they address how humans behave. Of course, thought and behavior are not independent. Both implicit and explicit cognitions shape perception, judgment, and action whether the actor is aware of the influence or not. As such, social policies may be ineffective or counterproductive when they assume that (1) human behavior is necessarily the result of conscious intent; and (2) people are aware of the causes of their behavior. Social policy design, implementation, and evaluation can be most effective when based on realistic models of the mind.

The study of implicit social cognition is a basic science enterprise. That is, the research is defined by the fundamental theoretical knowledge it develops, without direct consideration of practical implications. However, as often occurs, basic research about implicit social cognition has become the basis for applied science (e.g., Lee, Rogge, & Reis, 2010; Molesworth & Chang, 2009; Petroczi et al., 2010; Teubel, Asendorpf, Banse, & Schnabel, *in press*), and for social application in law (Blasi & Jost, 2006; Greenwald & Krieger, 2006; Kang & Banaji, 2006; Kang & Lane, 2009; Rachlinski, Johnson, Wistrich, & Guthrie, 2009), organizational practices (Agerström & Rooth, 2011; Chugh, 2004; Leavitt, Fong, & Greenwald, 2011; Rooth, 2010; Srivastava & Banaji, 2011), education (Cvencek, Greenwald, Brown, Snowden, & Gray, 2010; Nosek et al., 2009), and health (Green et al., 2007; Schwartz, Vartanian, Nosek, & Brownell, 2006; Teachman, Cody, & Clerkin, 2010; Wiers, Rinck, Kordts, Houben, & Strack, 2010). Potential connections between basic and applied implicit social cognition are intuitive, resulting in a rapid accumulation of debate and discussion about how to apply research in implicit social cognition (Bagenstos, 2007; Bartlett, 2009; Greenwald, 2008; Jolls & Sunstein, 2006; Jost et al., 2009; Kang, 2006; Krieger & Fiske, 2006; Landy, 2008; Mitchell & Tetlock, 2006; Rudman, 2008; Tetlock & Mitchell, 2009).

Research in implicit social cognition can impact social policy in at least two ways. First, practitioners who design and evaluate policy could apply theory and evidence from this body of research. For example, they might consider the determinants of social behavior that subvert conscious intention, awareness, or control. Second, practitioners might employ measurement methods of implicit social cognition in order to further their policy goals. These methods might include the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998), evaluative priming (Fazio, Sanbonmatsu, Powell, & Kardes, 1986), and their derivatives.

We begin this article by reviewing the accumulated evidence about implicit social cognition with relevance for social policy. Next, we consider opportunities and challenges regarding applications of this evidence and these measurement techniques to social policy. Finally, we close by outlining our perspective on the role of basic science in general, and implicit social cognition in particular, for policy design and evaluation.

## What Is Implicit Social Cognition?

Implicit social cognition is a descriptive term encompassing thoughts and feelings that occur independently of conscious intention, awareness, or control (Greenwald & Banaji, 1995; Nosek & Greenwald, 2009; Nosek, Hawkins, & Frazier, 2011). This term does not refer to a specific psychological process. In practice, implicit social cognition is conceived as a contrast to explicit social cognition. Explicit social cognition consists of thoughts and feelings that are a product of intention, are consciously available, are controlled, and require mental resources (Bargh, 1994; see also Moors & De Houwer, 2006). The absence of any of these features suggests that the behavior is not merely a product of explicit processes. A consequence of this descriptive definition is that implicit social cognition is heterogeneous and inclusive of multiple psychological processes.

Definitions that focus more on what the concept is not than what the concept is can be dissatisfying. However, this approach is appropriate in the current context for two reasons. First, while a variety of theoretical models and taxonomies of automaticity and implicit cognition have been proposed (e.g., Bargh, 1994; Chaiken & Trope, 1999; Moors & De Houwer, 2006; Smith & DeCoster, 2000), those theories and taxonomies are still maturing. In many cases, measures and outcomes clearly have an implicit component, but researchers have not yet clarified the particular processes contributing to their implicitness.

Second, for policy application in particular, the default behavioral assumption is that behavior is a function of deliberate, explicit cognition. The key insight from implicit social cognition—that behavior is influenced by cognition that occurs outside of awareness, intention, or control—is itself meaningful for social policy assessment and improvement. For some policy matters, there may be different implications depending on the specific contributing psychological processes. For example, consider a defendant named Carlee, who was aware of a psychological process producing illegal behavior but could not control the process, and another defendant named Calvin, who was unaware that the process was operating, in addition to lacking the ability to control it. Is Carlee more culpable than Calvin is? If this difference in psychological states is material for policy implications, then policy must make the distinction between the contributing processes to implicit cognition. If, however, psychological states are immaterial and policy is relevant only to the ultimate behavior, then the molar view of how implicit social cognition influences behavior may be sufficient or preferable to the microview that parses among particular psychological processes.<sup>1</sup>

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<sup>1</sup> Relatedly, it is common to have a relatively naïve understanding of the operative processes of measurement but still have a productive understanding of its usefulness in predicting behavior. For example, the processes underlying conscious introspection for answering survey questions are largely a mystery, but survey measurement is used productively for predicting and understanding behavior (Nosek & Greenwald, 2009).

Implicit social cognition research includes experimental investigation of the conditions or factors that contribute to behavior, such as priming concepts, affective reactions, or goal-states (Anderson et al., 2007; Bargh & Chartrand, 1999; Bargh & Ferguson, 2000). Implicit social cognition research also emphasizes the assessment of social cognition with procedures that do not require awareness of the association between the attribute of interest and the response generated (Nosek & Greenwald, 2009). Thoughts and feelings are assessed without the respondent deliberately introspecting and generating a report, as they would in a survey. Consequently, implicit measures can reveal mental content that respondents are otherwise unwilling or unable to report.

Consider, for example, the IAT (Greenwald et al., 1998; Nosek, Greenwald, & Banaji, 2007a), the most popular measure in implicit social cognition research (Nosek et al., 2011). In the IAT, items representing one of four categories, such as male, female, career, and family appear on a computer screen one at a time. Participants must categorize the items into their respective category using one of two keys on the keyboard as quickly as they can. There are two critical conditions of the task. In one condition, participants categorize items representing male (e.g., he, boy) and career (e.g., business, salary) with one key, and items representing female (e.g., she, girl) and family (e.g., children, home) with the other key. In the other condition, participants categorize items representing female and career with one key, and male and family with the other key.

The implicit measure of association strengths is a comparison of the average response time categorizing items between the two conditions. The logic of the task is straightforward; people should be faster to categorize the items when the categories sharing a response key are associated mentally than if they are not associated. In this case, most people are faster categorizing male and career (and female and family) with the same key compared to the reverse (Nosek et al., 2007b). This is interpreted as an implicit stereotype because participants do not consider whether they differentially associate the genders with career and family; they just categorize the items as quickly as they can. Respondents have no opportunity to consider and endorse or reject the thoughts that influence performance on the IAT.

The IAT is just one of a wide variety of implicit measurement methods (Nosek et al., 2011; see e.g., Bar Anan, Nosek, & Vianello, 2009; Fazio et al., 1986; Nosek & Banaji, 2001; Payne, Cheng, Govorun, & Stewart, 2005). In this article, cited evidence makes use of a variety of methods. We do not emphasize the methodological distinctions except where particularly important. In any case, all implicit measures can reveal associations that the respondent would genuinely reject as invalid if the opportunity was available.

### **Claims about Implicit Social Cognition with a Strong Foundation of Evidence**

The history of implicit social cognition includes both theoretical developments about nonconscious or automatic thoughts and empirical demonstrations of nonconscious or automatic thinking (e.g., Bargh, 1994; Bargh & Chartrand, 1999; Freud, 1900/1972; Greenwald, 1992; Helmholtz, 1910/1925; Nisbett & Wilson, 1977; Schneider & Shiffrin, 1977; Shiffrin & Schneider, 1977). Investigation of implicit social cognition increased dramatically during the 1990s and 2000s with the emergence of effective implicit measurement methods (for reviews of implicit measures, see De Houwer, Teige-Mocigemba, Spruyt, & Moors, 2009; Fazio & Olson, 2003; Nosek et al., 2007a; 2011; Teige-Mociemba, Klauer, & Sherman, 2010; Wentura & Degner, 2010). Here, we consolidate the considerable research literature to what, we believe, are claims that have a strong basis of empirical support about implicit social cognition (for more detailed reviews of implicit social cognition, see Gawronski & Payne, 2010; Greenwald & Banaji, 1995; Nosek et al., 2011).

It is now received wisdom that (Claim 1) much of mental life occurs outside of conscious awareness or control. Many mental processes occur independently of conscious experience and conscious intention (Bargh, 1994; Bargh & Chartrand, 1999; Nisbett & Wilson, 1977; Wegner, 2002; Wilson, 2002). Moreover, people lack complete control of what enters their minds. (Claim 2) Exposure to information, even exposure brief enough to avoid being consciously experienced, is sufficient for information to be encoded in memory (Draine & Greenwald, 1998; Kunst-Wilson & Zajonc, 1980; Murphy & Zajonc, 1993; Zajonc, 1968). Zajonc (1968) flashed images of Chinese pictographs so briefly that participants did not detect their appearance. Later, when asked to decide which of a set of pictographs they preferred, participants were more likely to select the ones that had been presented earlier. Subliminal exposure to this information was sufficient to alter participants' evaluations without their knowledge of the source or its influence.

As a consequence, (Claim 3) people may possess associations with which they actively and honestly disagree (Banaji, 2001; Banaji, Nosek, & Greenwald, 2004; Devine, 1989; Gawronski & Bodenhausen, 2006). These associations are "implicit" in that they may have unrecognized origins or existence in mind. Or, even if they are recognized, they may persist in memory. For example, many people who report egalitarian values and attitudes possess implicit associations linking the concept good with young people, White people, thin people, and straight people more easily than with old people, Black people, fat people, and gay people, respectively (Cunningham, Nezlek, & Banaji, 2004; Nosek, Banaji, & Greenwald, 2002; Nosek et al., 2007b). Likewise, many people associate weapons more with Black than White people (Nosek et al., 2007b) resulting in faster identification of

weapons, and erroneous identification of tools as weapons, after briefly flashing a Black face compared to a White face (Payne, 2001). Further, in a simulated context, this stereotype can manifest in an increased likelihood of erroneously shooting unarmed Black targets or failing to shoot armed White targets (Correll et al., 2002, 2007; Glaser & Knowles, 2008; Greenwald, Oakes, & Hoffman, 2003). Implicit associations like these may form in memory via mechanisms that are distinct from the formation of explicit attitudes and beliefs (Ranganath & Nosek, 2008; Rydell & McConnell, 2006). In particular, implicit associations may be sensitive to contingencies observed in the environment, regardless of whether one is aware of, or agrees with, those contingencies (Gawronski & Bodenhausen, 2006).

The most popular topic of investigation in implicit social cognition research is the evaluation of social groups. This research reveals that (Claim 4) implicit preferences favoring some social groups over others are pervasive across hundreds of studies and millions of participants (Nosek et al., 2002; Nosek et al., 2007b).<sup>2</sup> Nosek and colleagues (2007b) summarized findings from more than a dozen social evaluations, with more than four million completed implicit measures. They observed that implicit social preferences were present across age, gender, race/ethnicity, education, region, and ideology. Notably, however, while evidence has accumulated with millions of participants, few studies have employed representative samples in order to obtain population estimates of implicit associations.

Across the accumulated data, (Claim 5) the magnitude of implicit preferences varies by topic, person, and situation. Some topics elicit strong average implicit preferences, such as evaluations of young compared to old people, and others elicit much weaker average implicit preferences, such as evaluations of Democrats compared to Republicans (Lindner & Nosek, 2009; Nosek et al., 2002). Simultaneously, implicit preferences vary substantially across individuals for any given topic. For example, Democrats tend to implicitly prefer Democrats and Republicans tend to implicitly prefer Republicans (Lindner & Nosek, 2009; Nosek et al., 2002; Nosek, Banaji, & Jost, 2009). Further, different implicit preferences for the same content may be elicited depending on the social situation or context (Blair, 2002), a topic that will be taken up in more detail in the next section.

(Claim 6) Implicit social cognition is distinct, but related to self-reported evaluation of the same content (Cunningham, Preacher, & Banaji, 2001; Greenwald & Farnham, 2000; Nosek & Smyth, 2007; Payne, Burkley, & Stokes, 2008). Correlations of individual differences between the two assessments range from weakly to

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<sup>2</sup> Not everyone agrees. Blanton, Jaccard, Gonzales, and Christie (2006) speculate that IAT measurement does not have a rational zero-point and estimates of implicit preferences for majority or socially favored groups may be exaggerated. However, others argue that the available empirical examinations have supported interpretations of the IAT zero-point as indicating no difference in association strengths between the two response conditions (Greenwald, Nosek, & Sriram, 2006; Greenwald et al., 2002; Greenwald & Nosek, 2008).

strongly positive across topics (Nosek, 2007). For example, implicit and explicit measures of preferences for young, as opposed to old, people are weakly correlated ( $r \sim .10$ ), whereas implicit and explicit measures of preferences for Democrats, as opposed to Republicans, are strongly correlated ( $r \sim .60$ ). Further, low correlation between implicit and explicit measures does not appear to be attributable to the former reflecting perceived attitudes of the culture whereas the latter reflects one's own evaluations (Gawronski, Peters, Brochu, & Strack, 2008; Nosek & Hansen, 2008; Uhlmann, Poehlman, & Nosek, 2012).<sup>3</sup> There is substantial evidence, however, that (Claim 7) variation in implicit-explicit correspondence across topics and individuals is predicted by features of the evaluation. For example, when self-presentation concerns are higher, such as for attitudes toward groups defined by race as opposed to political party, implicit-explicit correspondence tends to be weaker (Fazio, Jackson, Dunton, & Williams, 1995; Nosek, 2005). Moreover, stronger or more important attitudes elicit stronger implicit-explicit correspondence than do weaker attitudes (Karpinski, Steinman, & Hilton, 2005; Nosek, 2005).

Ultimately, the most relevant evidence for policy implications is that implicit social cognition predicts behavior. A foundational insight that cast doubt on self-reported explanations of one's own behavior and led to the emergence of implicit social cognition is that (Claim 8) people do not observe their mental operations. People can be simultaneously confident and wrong about the reasons for their own behavior (Bem, 1972; Nisbett & Wilson, 1977). This makes the introspective assessment of the reasons for one's behavior interesting, but indeterminately related to actual causes of the behavior. Also, as implied already, (Claim 9) implicit and explicit processes both influence behavior (Bargh, 1994; Bargh & Chartrand, 1999; Bargh & Ferguson, 2000; Chaiken & Trope, 1999).

There are several remarkable examples of this phenomenon. For example, people subtly primed with words relating to politeness were less likely to interrupt another person's conversation than people primed with words relating to rudeness (Bargh, Chen, & Burrows, 1996). Moreover, priming people with the concept "professor" improves their performance on a trivia game compared to priming the concept "soccer hooligan" (Dijksterhuis & van Knippenberg, 1998). Finally, experiencing physical warmth by holding a cup of coffee increases feelings of warmth toward other people (Williams & Bargh, 2008). It is probably no surprise that people do not recognize these influences on their behavior. Similarly, a meta-analysis of studies measuring both implicit and explicit cognitions about the same concepts finds that both predict behavior (Greenwald, Smith, Sriram,

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<sup>3</sup> While we believe the empirical evidence for this is strong, not everyone agrees (Arkes & Tetlock, 2004; Han, Olson, & Fazio, 2006; Karpinski & Hilton, 2001; Olson & Fazio, 2004). Furthermore, there is an interesting debate on whether such cultural knowledge would be considered an extraneous influence on implicit measurement or part of implicit social cognition (Gawronski et al., 2008; Nosek & Hansen, 2008; Olson & Fazio, 2004).

Bar-Anan, & Nosek, 2009). In some cases, self-reported evaluations predict better than evaluations measured implicitly; in other cases, implicitly measured evaluations predict better, particularly in socially sensitive circumstances.

Importantly, (Claim 10) both implicit and explicit social cognition predict variation in human behavior that is not predicted by the other.<sup>4</sup> Implicit and explicit measures are not redundant; each can contribute independently to predict human behavior (Greenwald et al., 2009). In total, these claims provide a foundation of evidence for implicit social cognition's construct and predictive validity.

### Uncertainties in Implicit Social Cognition

Science is cumulative. New evidence builds on, clarifies, or modifies prior evidence, leading to a more accurate account of reality. This is a process of uncertainty reduction as theoretical models improve at predicting and explaining behavior. The prior section delineated 10 claims that, in our view, have a firm foundation of evidence and relatively certain validity. Many of these claims are represented in existing theoretical models that explain how implicit processes influence behavior (e.g., Chaiken & Trope, 1999; Fazio, 1990; Gawronski & Bodenhausen, 2006; Smith & DeCoster, 2000; Strack & Deutsch, 2004). The models are largely concordant in their major themes, and differ on important details.

A goal of science is to generate models that are, on the one hand, simple and comprehensible, and, on the other hand, powerful, predicting as much variation in behavior as possible. However, there may never be a perfect model of behavior.<sup>5</sup> In this article, we emphasize the empirical findings and claims that are common across models, rather than situate the article in just one of the many theoretical accounts. Theories will appear, improve, and fade in popularity over time. The lasting contributions of scientific research for policy implications are the empirical findings. Those will need to be explained by theory, but they will inform policy no matter which theory is presently perceived as best.

This section describes research evidence about implicit social cognition that either (1) highlights uncertainties in measurement and prediction or (2) reflects the need for continued elaboration of theory and evidence. Understanding such areas of scientific uncertainty will help clarify the appropriate application of implicit social cognition to policy, a point to which we will return in the closing of this article.

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<sup>4</sup> Not everyone agrees. Blanton and colleagues (2009) suggest that the predictive validity evidence for the IAT, particularly with regard to racial attitudes, is specious. They reanalyzed data from two published studies to support their claims (McConnell & Leibold, 2001; Zeigart & Hanges, 2005). The original authors disagreed with Blanton and colleagues analytical criticisms (McConnell & Leibold, 2009; Zeigart & Hanges, 2009).

<sup>5</sup> Isaac Asimov's Foundation series imagined a future in which psychological models became so advanced that behavior on a large scale could be predicted in advance. As one might predict, the models still failed in vitally important ways.

*Implicit Measures are Influenced by Extraneous Factors*

No psychological measure is a perfect assessment of its target construct, due to imperfect internal consistency, extraneous influences, and lack of clarity in the construct definition. An important source of uncertainty for implicit measures is that assessment is usually indirect; the construct of interest is inferred based on performance of another task. In the Affect Misattribution Procedure (AMP; Payne et al., 2005), for example, participants rate a series of unfamiliar Chinese ideographs as pleasant or unpleasant. Immediately before presenting the ideographs, a prime image or word appears briefly. Despite instructions to ignore them, primes systematically influence ratings of the ideographs. The implicit measure assesses the indirect influence of the prime on evaluation of the ideographs. However, to the extent that the ideographs themselves have any influence on the evaluation, the measure is not a “pure” assessment of evaluations of the primes. As a consequence, indirect measures tend to have lower internal consistency than direct measures. Implicit measures have internal consistencies ranging from very low, as in sequential priming procedures (Cunningham et al., 2001; Olson & Fazio, 2003), to moderate or strong, as in the AMP, IAT, and variants of the IAT (Nosek et al., 2007a, 2011; Payne et al., 2005).

The IAT and other procedures that compare average response latencies between two or more conditions are also influenced by extraneous procedural factors. For example, slower average response latencies are associated with larger differences between response conditions (Cai, Sriram, Greenwald, & McFarland, 2004; McFarland & Crouch, 2002; Mierke & Klauer, 2003; Sriram, Greenwald, & Nosek, 2010). Also, the critical response condition performed first tends to interfere with the one performed second (Greenwald et al., 1998).

Extraneous influences reduce reliability and negatively affect construct and predictive validity. As such, identification of extraneous influences is an important step toward reducing their impact (see Nosek et al., 2007a for a review of extraneous influences on the IAT in particular). For example, a procedural adaptation for the IAT can reduce the extraneous influence of pairing order (Nosek et al., 2005), and an analytic improvement can reduce the extraneous influence of overall average latency (Greenwald et al., 2003; Mierke & Klauer, 2003). Further, analytic practices may allow researchers to isolate and nullify extraneous influences (Cunningham et al., 2004; Nosek & Smyth, 2007). Relatedly, multiple processes contribute to performance on implicit measures (Conrey, Sherman, Gawronski, Hugenberg, & Groom, 2005), and analytic or procedural innovations may isolate the key components of task performance (Sherman, Klauer, & Allen, 2010). To the extent that extraneous factors influence assessment, there will be greater uncertainty in interpretation of the effect.

*Implicit Social Cognition Is Malleable*

One conceptualization of the representation of implicit attitudes, identities, and stereotypes is to imagine them as things that exist in one's memory. In a relevant situation, that thing might be activated, much like finding and retrieving a particular book in a library. A more challenging alternative is to imagine implicit social cognitions as mental states, not things—the concepts are “built” from relevant memory traces but also fundamentally linked to the circumstances in which they occurred (Smith, 1998; Smith & Conrey, 2007).

Implicit social cognition is contextualized. This means that it is a function of both the preexisting content inside the person and the social circumstance in which it occurred (Blair, 2002; Gawronski & Sritharan, 2010; Lewin, 1943). Despite their automatic generation, implicit evaluations are sensitive to social circumstances, such as contextual clues about the valence of the social target (Barden, Maddux, Petty, & Brewer, 2004), viewing positive or negative instances before evaluating a social category (Dasgupta & Greenwald, 2001; Joy-Gaba & Nosek, 2010), participants' motivation to affiliate with another person whose beliefs are readily apparent (Sinclair, Lowery, Hardin, & Colangelo, 2005), or even mental and physiological states, such as implicit evaluations of smoking among habitual smokers following relative deprivation from smoking (Payne, McClernon, & Dobbins, 2007; Sherman, Rose, Koch, Presson, & Chassin, 2003).

This evidence for malleability has produced unresolved (perhaps unresolvable) theoretical debates about whether implicit social cognitions are better thought of as things that exist or outcomes that are constructed (Fazio, 1990; Martin & Tesser, 1992; Mitchell, Nosek, & Banaji, 2003; Schwarz, 1999; Schwarz & Bohner, 2001; Smith, 1998; Smith & DeCoster, 2000). Regardless of one's position in that debate, it is clear that implicit measurement elicits some degree of stability over time (trait-like) and some degree of malleability across time and circumstance (state-like). For example, across studies, the IAT showed an average test-retest reliability of 0.56, an estimate that varied little as a function of the time between the two tests (Nosek et al., 2007a). The key implication for policy considerations is that implicit social cognition is not a fixed entity; it is dynamically interrelated with the social situation. Social circumstances may have implications for what is measured and how implicit social cognition predicts behavior.

*How and When Does Implicit Social Cognition Predict Behavior?*

Accumulated evidence leaves no doubt that implicit measures predict behavior (Greenwald et al., 2009), but this evidence has not yet converged into a dominant model accounting for how and when implicit social cognition predicts behavior. Nosek et al. (2011) reviewed existing theories and evidence and suggested that implicit social cognition is more likely to predict behavior when the individual

lacks (1) motivation to deliberately direct the behavior; (2) opportunity to initiate the relevant behavior; (3) ability to control the behavior; or (4) awareness of factors that influence the behavior (e.g., Fazio, 1990; Gawronski & Bodenhausen, 2006; Perugini, Richetin, & Zogmaister, 2010).

The context of interracial interaction illustrates these factors. People may possess motivation, opportunity, ability, and awareness to control what they say in an interaction with a person from another racial group, but they may lack motivation, opportunity, ability, or awareness to control their nonverbal behavior in that interaction. For example, Dovidio, Kawakami, and Gaertner (2002) found that implicit, but not explicit, measures of racial attitudes predicted difficult-to-monitor and difficult-to-control nonverbal behaviors, such as blinking rate and amount of eye contact (see also Fazio et al., 1995; McConnell & Leibold, 2001).

Simultaneously, some behaviors are ostensibly deliberate and controllable and can still be predicted by measures of implicit social cognition. For example, voting is perhaps a prototype of a controlled action: people must be motivated to vote, they have ample opportunity to decide their vote, and they can deliberately cast their vote for their chosen candidates or causes. The prevailing assumption is that people are aware of the basis for their vote. Even so, implicit measures predict variation in voting behavior that self-report measures do not. For example, implicit racial preferences for White people compared to Black people predicted reported vote in the 2008 U.S. Presidential election between Barack Obama and John McCain (Greenwald et al., 2009; Payne et al., 2010). Moreover, implicit measures of political positions predict undecided voters' ultimate votes (Galdi, Arcuri, & Grawronski, 2008; Roccoato & Zogmaister, 2010) and political Independents' partisan decision making (Hawkins & Nosek, 2012). As behavioral prediction is the area of most theoretical and practical interest, refinement of the conditions under which implicit measures predict behavior is likely to enjoy rapid progress in the next decade.

How strongly should implicit social cognition predict behavior for this association to be considered substantively interesting or important? In an interview with the *New York Times*, psychologist Philip Tetlock declared the candidacy (and ultimate election) of Barack Obama over John McCain in 2008 to be "a major embarrassment for the unconscious-bias crowd" because it should not have occurred if "unconscious bias were as pervasive and potent as typically implied" (Tierney, 2008). As the columnist asked, if more than 80% of whites have an implicit preference for Whites over Blacks, and "whites made up 74% of the voters . . . , why is Barack Obama going to be the next president?"

This implies that implicit racial bias ought to account for 100% of the variation in White people's voting behavior. However, voting behavior, like most behavior, is influenced by multiple variables. Consider, for example, just a few of the relevant social biases that could have played a role in a voter's choice between Obama and McCain—implicitly or explicitly. Age, height, and attractiveness biases would

likely have favored Obama, while stereotypes associating White people with the categories American and Presidents would have favored McCain. Of course, social biases are not the sole influences on voting behavior. The most obvious is ideology. A single-item self-rating of strongly liberal to strongly conservative accounts for 85% of the variation in U.S. presidential vote in elections between 1972 and 2004 (Jost, 2006). In other words, asking that single item leaves just 15% of the variation in voting behavior to be explained by other factors.

It is unlikely that any behavior is predicted perfectly by any single social bias, implicit or otherwise. So, how much should a social cognition predict a behavior for this association to be considered interesting or useful? This is a qualitative judgment and depends on the context of prediction. What is the behavior, what is the social cognition, what is the relevance of the social cognition to the behavior, and what other factors influence the behavior in that circumstance? In the case of voting for Barack Obama versus John McCain in 2008, published empirical evidence with two different implicit measures (IAT and AMP) suggests that implicit racial attitudes account for small but statistically significant variations in vote, even after accounting for political ideology and self-reported racial attitudes (perhaps as little as 0.5% and as much as 3.5%; Greenwald et al., 2009; Payne et al., 2010). Is that “enough”? Ultimately, that decision is a value judgment. The descriptive fact is simply that implicit race bias accounted for variation in vote that was not accounted for by other measures.<sup>6</sup>

### *Variation across Implicit Measures*

The nature and function of implicit social cognition is not defined by a single measurement method. A recent estimate suggests that more than 40% of the existing implicit social cognition literature used the IAT, another 20% used evaluative priming, and the remaining applications are distributed across a variety of measures (Nosek et al., 2011). Each measure’s idiosyncrasies constrain understanding of the measured psychological constructs. As such, diversity in measurement is important to identify what findings are idiosyncratic versus common across measurement procedures.

The literature is still relatively sparse on comparative investigations of implicit measures. The first published study found very little commonality among implicit self-esteem measures (Bosson, Swann, & Pennebaker, 2000). Subsequent studies tend to observe stronger associations among implicit measures, especially after accounting for unreliability in measurement (e.g., Cunningham et al., 2001; Ranganath, Smith, & Nosek, 2008). A few studies have identified particular measurement factors that may lead to stronger or weaker relations among implicit

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<sup>6</sup> In both studies, self-reported racial attitudes also significantly contributed to predicting vote—as strongly or even more strongly than implicit attitudes did.

measures (e.g., Olson & Fazio, 2003; Payne et al., 2008). In any case, it is clear that implicit measures may each reveal distinct aspects of implicit social cognition and may each have irrelevant procedural idiosyncrasies. For policy, the implication is that there is not yet a comprehensive account of the relations among implicit measures. Findings observed with one will not necessarily be observed with another. That does not mean that the findings are invalid, but that the connections among implicit measures and with the constructs of implicit social cognition are not fully resolved.

*Effectiveness of Interventions to Change, Prevent, Control Influence of Implicit Cognition on Behavior*

Possessing an implicit preference or stereotype does not guarantee that it will influence behavior. Even when conditions are aligned for a particular social cognition to influence judgment, people may engage corrective processes to avoid such an influence. Wilson and Brekke (1994) proposed a model of debiasing for the conditions necessary to eliminate unwanted thoughts from influencing judgment or behavior. People must (1) detect their unwanted thoughts, (2) be motivated to remove the biasing influence, (3) detect the size and direction of the biasing thoughts, and (4) redirect their own judgments or behaviors so that they are not contaminated by the biasing thoughts.<sup>7</sup>

It is not yet clear to what extent implicit social cognition is amenable to prevention or alteration at each of these stages, but there is evidence that corrective processes can moderate behavior (see Bartlett, 2009 for reviews). A variety of dual-process models articulate how implicit and explicit processes operate independently and interactively to produce judgment (Chaiken & Trope, 1999; Fazio, 1990; Gawronski & Bodenhausen, 2006; Strack & Deutsch, 2004). The critical point, for the purposes of policy implications, is that having thoughts is not the same as acting on those thoughts. If corrective processes are effective, unwanted implicit social cognitions may be present in mind but fail to influence judgment and action. Although explicit efforts to prevent the influence of unwanted implicit cognitions may not be completely effective,<sup>8</sup> the limits of debiasing via intentions are still undetermined. This presents an important area for further research and produces some uncertainty about the inevitability of implicit social cognition influencing behavior.

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<sup>7</sup> Notably, despite the intense interest in debiasing, there are no prominent theoretical models more recent than Wilson and Brekke's that provide a comprehensive account of the conditions necessary for debiasing. A great deal of empirical data has accumulated in the last 20 years, so this area appears ready for theoretical innovation.

<sup>8</sup> For example, people can believe that they have identified the causes of their behavior and/or engaged in corrective processes but, in fact, be wrong that they have done so (Nisbett & Wilson, 1977; Norton, Vandello, & Darley, 2004).

## Applying Implicit Social Cognition to Social Policy

The central implication of implicit social cognition is that social behavior is not just a product of conscious beliefs, values, and intentions. Thoughts and feelings that the individual may actively disagree with can exist in memory and influence behavior outside of awareness and control. How can policy makers apply this insight and the rest of theory and evidence about implicit social cognition?

At an abstract level, the principles of implicit social cognition can help evaluate whether policy and practice is behaviorally realistic (Kang & Banaji, 2006; Krieger & Fiske, 2006). In particular, people might assess a policy with the following questions. First, does the policy anticipate constraints of intention, awareness, and control on human behavior? If not, are there automatic processes that could subvert the goals of the policy? Second, can conditions ensure that actors have the awareness, opportunity, and ability to execute the desired course of action, if motivated to do so? If not, is there evidence that the likely automatic responses are in line with the policy objectives?

Third, for the policy to work, must the actors be aware of the conditions influencing their behavior? If so, how does the policy or practice ensure that people can identify these factors? Fourth, does the policy anticipate and account for contextual features that can influence behavior without the actors' recognition or control? If not, is it possible that such features could disrupt policy objectives? Finally, does evaluation of the policy's success rely on actors' self-assessments? For example, if a policy requires that the actor avoid using a target's gender in evaluation, is there any assessment of success other than the actor's report that he or she did not consider gender? Reviewing policy with these questions may elicit hypotheses or evidence that policy objectives are at risk because implementation and practices do not anticipate the role of implicit social cognition.

Next, we highlight several examples in which the influence of implicit social cognition in behavior is either implied or apparent. These applications are illustrative, not comprehensive, of opportunities to apply implicit social cognition.

### *Examples of Implicit Social Cognition Operating in Law, Health, Organizational and Civic Behavior*

The U.S. justice system employs a "rational actor" model of the mind. For example, a common criterion for inclusion on a jury is to ask potential jurors if they can objectively review the facts and avoid biasing influences. When inadmissible testimony is presented, a judge may instruct the jury to forget the information and not to allow it to influence their later judgment (Mueller & Kirkpatrick, 1995). Jurors may dutifully attempt to avoid bias and set inadmissible information aside, but research suggests that the mind is not always so accommodating (Kassin & Studebaker, 1998). In an experimental setting, jurors who were instructed to put

aside inadmissible information made decisions more similar to jurors who were allowed to use the information and differed most from jurors who never heard the information in the first place (Kassin & Sommers, 1997).

Likewise, while it is well understood that the social category and facial characteristics of criminal defendants are not supposed to influence judicial decisions, conviction, or sentencing, evidence suggests that they do (Griffin & Wooldredge, 2006; Johnson, 2003; Mustard, 2001). For example, an investigation of Arab and Jewish judges in Israel found in-group favoritism in decisions to detain suspects during bail hearing (Gazal-Ayal & Sulitzeanu-Kenan, 2010). Moreover, Eberhardt and colleagues found a link in the United States between the prototypicality of Black, death-eligible convicts' facial features, and likelihood of being sentenced to death versus a long prison term (Eberhardt, Davies, Purdie-Vaughns, & Johnson, 2006). After controlling for details of the crime and mitigating circumstances, those who had more stereotypically African facial features were more likely to receive a death sentence than those who had less stereotypically African facial features. Given the thoughtfulness and care with which judges and juries review criminal proceedings in general and death-eligible cases, in particular, it is unlikely that judges and juries were acting on explicit biases in these cases.

*Health and medicine.* Similar effects are observed in health and medicine, in which there is evidence that social biases contribute to important health decisions and disparities (Betancourt, Green, Carrillo, & Park, 2005; Brach & Fraserirector, 2000; Krieger, et al., 1993; Williams & Jackson, 2005). For example, Green and colleagues (2007) found that doctors with greater implicit racial bias were less likely to recommend an appropriate treatment for coronary heart disease to Black patients than doctors with less implicit racial bias. In another study, mental health professionals with greater implicit bias against mental illness were more likely than those with less implicit bias to see patient pathology that was not there (Peris, Teachman, & Nosek, 2008). Further, Penner and colleagues (Penner et al., 2010) showed that the quality of doctor-patient interaction could be predicted by the doctor's implicit racial attitudes. Doctors who self-reported little explicit bias, but had strong implicit bias were rated more negatively by Black patients than were other doctors.

*Organizational behavior.* The Civil Rights Act of 1964 prohibits discrimination on the basis of race, gender, and several other group classifications. However, enforcement of this law has relied on the assumption that those who discriminate do so intentionally. For example, an employer with a strong commitment to equity and diversity may nonetheless evaluate the same qualifications on a resume differently depending on the race of the applicant. In a naturalistic experiment, Bertrand and Mullainathan (2004) submitted resumes for many job postings across a variety of sectors of the workplace. Resumes with White-sounding names were 50% more

likely to receive a callback for an interview than the same resumes with Black-sounding names. The researchers speculated that implicit, rather than explicit, racial biases might be responsible for the discrepancy. Indeed, Rooth (2010) replicated the effect in Sweden; resumes with Swedish-sounding names received more callbacks than ones with Arab-sounding names. He then successfully recruited a portion of the HR professionals who had reviewed the resumes to complete a Swedish-Arab evaluative IAT. Those with stronger implicit Swedish preferences were more likely to have favored the Swedish applicants (see also Agerström & Rooth, 2011 for discrimination evidence toward obese people). Similar discriminatory effects occur in audit studies in other settings, such as purchasing cars, renting homes, or tipping cab drivers (Ayers, Vars, & Zakariya, 2004; List, 2004; Ondrich, Ross, & Yinger, 2003).

*Civic behavior.* In the United States, voters are assigned to voting locations that might include schools, churches, or other public buildings. This assumes that voting location has no effect on voting behavior. However, evidence suggests that voting in a school may lead voters to vote for more funding for education (Berger, Meredith, & Wheeler, 2008). Further evidence shows how simple, subtle primes can affect attitudes and political opinions. For example, the mere presence of an American flag can increase people's motivations for power and aggression (Ferguson, Carter, & Hassin, 2009; Hassin, Ferguson, Shidlovsky, & Gross, 2007). Furthermore, simple reminders of cleanliness increase conservative political attitudes (Helzer & Pizarro, 2011). Finally, subliminally priming Christian concepts in a U.S. sample increased racial prejudice toward African Americans (Johnson, Rowatt, & LaBouff, 2010). The key point from these examples is that judgment is affected by social context. A person's "real" opinion is not fixed in time and circumstance; it is subtly influenced by the setting in which that opinion, policy position, and vote is generated.

#### *A Common Policy Strategy: Just be Objective*

Implicit social cognition evidence challenges the assumption that people will be objective decision makers simply by deciding to be so. This assumption is prevalent in a variety of practices. For example, many organizations have nondiscrimination policies and report that they follow Employment Equal Opportunity Commission (EEOC) guidelines. By and large, these organizations do little more than instruct managers not to discriminate, and they fail to systematically evaluate whether the instruction is sufficient to avoid discrimination. Indeed, Bertrand and Mullainathan (2004) found that a company's claim to following EEOC guidelines was not associated with any reduction in racial discrimination in resume review.

Akin to declarations of self-objectivity during voir dire in jury selection, Uhlmann and Cohen (2007) found that asking questions like "Are you objective?"

and “Do you use the evidence and facts to make decisions?” (to which virtually all people agree) led to greater use of gender stereotypes in a subsequent simulated hiring decision. The researchers argued that the self-declaration of “I am objective” affirmed that one’s thoughts arise from objective sources, so whatever thoughts come to mind are acceptable to use. In a replication and extension of Uhlmann and Cohen’s (2007) study, Lindner, Graser, and Nosek (2011) found that presenting standard EEOC guidelines before hiring led the raters to believe that they had successfully avoided using inappropriate selection criteria, but did not change actual biases in social judgment (see Norton et al., 2004 and Uhlmann & Cohen, 2005 for related examples of failing to recognize bias in one’s own behavior). Despite their prevalence, admonitions against discrimination may not be sufficient on their own to prevent decision makers from acting on their biases, because decision makers may not recognize that they have biases or that the biases impact their behavior.

### *Alternate Policy Strategies That Improve Behavioral Realism*

If intention, self-awareness, and self-control are not sufficient to eliminate unwanted biases from influencing behavior, then how do we ensure that the individual or organizational goals and values are responsible for the judgment or action? We would be delighted to provide an answer, but scientific research has not yet produced a straightforward solution to this problem. There is, however, sufficient evidence to provide a framework for behaviorally realistic evaluation of policy alternatives.

First, if particular unwanted biases are identified, then interventions can be designed to change the biases themselves (see Blair, 2002; Gawronski & Sritharan, 2010; Nosek et al., in press for reviews). As discussed earlier, interventions such as exposure to counterstereotypes (Dasgupta & Greenwald, 2001) or to explicit beliefs and values of important individuals in a social context (Sinclair, Huntsinger, Skorinko, & Hardin, 2005) can shift implicit evaluations. The main challenges for this strategy are (1) whether the shift will be durable, especially if the social context is temporary, and (2) whether the intervention can change all of the unwanted biases. If, for example, the goal is evaluate a target based on relevant job skills and not social features, then the intervention would need to affect social biases relating to age, gender, race, sexual orientation, weight, attractiveness, height, and whatever other job-irrelevant social categories are likely vary across the targets. No known intervention has such a pervasive impact.

As such, a second strategy is to teach decision-makers strategies to prevent the unwanted biases from being activated or influence judgment (Wilson & Brekke, 1994). For example, motivation to respond without prejudice can be effective at reducing discriminatory behavior (Devine, Plant, Amodio, Harmon-Jones, & Vance, 2002; see Bartlett, 2009 for a review). The mechanisms underlying this

effect are not yet well understood, but it could be akin to the corrective processing of fear and other affective reactions. For example, watching a horror film elicits a fearful response automatically, but people do not run from the theater; they have slower, but effective, interpretive processes that correct the fear response with the knowledge that it is just a movie.

Another strategy for decision making might counter the biasing effects of the “I am objective” mindset mentioned earlier. Decision makers might recognize the potential for bias in decision making and adopt an internal adversarial approach to considering, questioning, and ultimately adopting a position. If decision makers actively play devil’s advocate, generating evidence opposing an initially preferred decision or in favor of an alternative, then they may discover their own assumptions that made the initial decision appear more attractive than justified. However, the influence of biases in judgment and decision making are notoriously difficult to prevent, even among people who have relevant knowledge and strategies (Gilovich, Griffin, & Kahneman, 2002), making it unlikely that these strategies will provide a comprehensive solution on their own.

Finally, a third strategy is to design the behavioral or decision-making context itself so that unwanted biases can be intervened with or prevented from exerting influence in the first place. For example, Goldin and Rouse (2000) found evidence that the slow and then rapid increase of hiring women in major orchestras was caused by the introduction of blind auditions during the review process. Adding a screen removed gender information from a critical stage of evaluation. Gender simply could not influence judgment, because the evaluators did not know the musician’s gender.

This approach has many possible applications, even for circumstances in which the evaluator cannot be completely blind to the target’s social characteristics. For example, the legal system employs prescriptive standards in sentencing guidelines as a means to reduce subjective biases. Evidence suggests that departure from these standards is an important source of racial disparities in sentencing (Johnson, 2003). At the same time, judges tend to dislike strict standards because they disallow consideration of unanticipated mitigating circumstances. To provide a balanced approach to these competing concerns, the judge could be required to write a structured summary of the mitigating circumstances without social group characteristics, or other irrelevant information about the defendant and case. Other judges—who are thus blind to those features that are irrelevant for sentencing—could provide feedback on the mitigating circumstances and the proposed sentence. To the extent that the structured summary is free from social biases, this expert feedback would provide an external check for the judge to inform the ultimate sentence.

One could even imagine adapting such a process for performance evaluation of employees. The evaluating supervisor cannot easily be blinded to employee identities, but committees of other supervisors could review performance reports

or other performance indicators with identifying information redacted. Comparing identity-conscious and identity-blind evaluations can identify discrepancies and provide fodder for investigating whether social bias could be a contributing factor. In summary, if multiple evaluators collectively have access to all information, but individually are blinded to particular pieces of information, then it is possible to identify whether a given piece of irrelevant information has an unintended impact. Such practices may offer opportunities to correct biased processes even when individual evaluators fail to recognize influences on their own decision making.

Together, three approaches—reducing the existence of bias, providing decision-making strategies, and restructuring the decision-making process—provide the means for individuals and organizations to ensure that their judgment or actions reflect their goals and values. However, the evidence for implicit social cognition influencing behavior is well ahead of the evidence for strategies to mitigate that influence when it is unwanted. An important next step in the bridging of basic research and application is to develop and evaluate interventions in real-world contexts. These intervention attempts, regardless of their success, will inform the basic research enterprise of determining how and when implicit social cognition influences behavior and how it can be prevented when social biases are misaligned with values or goals.

### **Using Implicit Measures in Social Policy**

The previous section discussed how existing theory and evidence from implicit social cognition may inform social policy. Another potential application is to incorporate implicit measurement methods themselves into social policies. For example, a company concerned about the effects of implicit bias in performance evaluations and hiring might develop training procedures in which managers complete implicit measures as an educational exercise about unwanted biases and how to avoid them. Another organization may decide to use implicit measures as a selection device for managers; those who show strong implicit biases against social groups that are important to the organization might be less likely to be hired. A prosecuting (or defense) attorney might administer implicit measures to a defendant to assess whether implicit biases are consistent with the purported criminal act. These illustrate three potential applications of implicit measures in policy: education, selection, and evaluation. We consider the present viability of each in turn.

#### *Implicit Measures as Educational Devices*

Are implicit measures useful as educational or (un)consciousness raising devices? Project Implicit operates a public website (<https://implicit.harvard.edu/>)

at which visitors can learn about implicit biases with descriptive educational materials and self-administered implicit measures that provide feedback about performance. Since its introduction in the fall of 1998, more than 13 million tests have been completed. The site retains persistent popularity with the general public, as part of psychology and other social science courses, and among organizations that send employees during education and training efforts. Further, on average, participant evaluations after completing the measures at the website are highly favorable (Frazier, Nosek, Greenwald, & Banaji, 2010; see also Morris & Ashburn-Nardo, 2010; Morris, Ashburn-Nardo, & Padgett, in press). This suggests that people perceive the experience of completing implicit measures to be educational, perhaps provocative, and, at least, engaging.

However, does experience with implicit measurement have any impact on subsequent beliefs or behavior? Some research suggests that it does. Monteith and colleagues found that experience with an IAT measuring racial bias increased subsequent liking of Black names to the extent that the person felt negatively about their implicit bias (Monteith, Ashburn-Nardo, Voils, & Czopp, 2002). Furthermore, Menatti, Smyth, Teachman and Nosek (in press) found that completing an implicit measure of attitudes toward people with mental illness reduced subsequently self-reported stigmatizing mental illness attitudes. However, these studies did not investigate whether such effects were durable beyond the immediate impact of the learning episode.

Joy-Gaba and Nosek (2011) evaluated the immediate and long-term impact on beliefs about the existence and operation of implicit bias following a one-hour interactive lecture. The lecture was part of college orientation for more than 3,000 students in the University of Virginia class of 2014; it included experiential illustrations of automaticity as well as group demonstrations of the IAT. Participants' beliefs about bias and motivation to address bias changed immediately following the presentation, and that change was durable at a follow-up assessment 2–4 months later. However, there was no evidence that the education mitigated biases in social judgment months after the presentation occurred (Joy-Gaba & Nosek, 2011).

Such education using implicit measures might counter the biasing effects of the self-objectivity mindset discussed in the previous section (Lindner et al., 2011; Uhlmann & Cohen, 2007). Direct experience with one's own implicit biases may initiate "cues for control," lead people to monitor their decisions more carefully, and initiate corrective efforts when unwanted thoughts are noticed (Monteith et al., 2002; Monteith & Mark, 2005; Monteith, Mark, & Ashburn-Nardo, 2010; see also Legault, Green-Demers, & Eadie, 2009). In summary, the present evidence suggests that using implicit measures as an educational device can increase awareness and knowledge about implicit biases. However, it is not yet clear whether and when education alone can eliminate the effects of social biases in judgment and behavior.

*Implicit Measures as Selection Devices*

Educating potential jurors or HR managers with implicit measures is quite different than using performance on implicit measures as an eligibility criterion for selecting jurors or managers. The temptation to pursue implicit measures for selection purposes is easy to understand. As demonstrated by Rooth (2009), HR staff members' implicit racial biases predicted discrimination in receiving job interviews. This result appears to offer a straightforward policy implication: measure HR staff applicants and hire those with the weakest unwanted implicit biases. However, we believe that such an action overapplies a stereotype about implicit bias: that people with stronger implicit preferences for one social group over others are more likely to behave in biased ways that favor that social group.

Although the reviewed evidence shows that this stereotype is true in the aggregate, in our view, applying this to individual cases disregards too much uncertainty in measurement and predictive validity. First, individual scores are sensitive to the context of measurement and show both trait-like and state-like components, so selection based on a single assessment is constrained to the circumstances of assessment. Second, while less fakeable than self-report measures, implicit measures are not immune to deliberate alteration (for a review of studies, see Nosek et al., 2007a); some progress in identifying faking has not removed the possibility of deliberate alteration (Cvencek et al., 2010). Third, the circumstances of predictive validity are not yet well enough understood to anticipate when or how much a particular implicit bias will influence behavior. Finally, and most importantly, implicit measures assess thoughts, not behaviors—at least not behaviors of consequence. Social policies are for regulating behaviors, not thoughts. Thinking particular thoughts might increase the likelihood of particular behaviors, but it does not guarantee that they will occur. People who use effective control strategies may never show behavioral evidence of their implicit biases. Likewise, someone with detectable but weak implicit biases may still evidence behavioral effects if he has ineffective control strategies.

Taken together, there is substantial risk for both falsely identifying people as eventual discriminators and failing to identify people who will discriminate. It is possible that, with time, the uncertainties of implicit measurement, predictive validity, and control will decrease sufficiently to make such applications more palatable. However, our position, which we recognize as normative, not scientific, is that the present sensitivity of implicit measures does not justify this application.

*Implicit Measures as Evaluation Devices*

Another potential application of implicit measures is the counterpart to selection. Whereas selection policies would use implicit measures to anticipate future

events (would this person be biased or not in the future?), evaluation policies would use implicit measures to evaluate something that occurred in the past. For example, in the legal context, could a defendant's crime be classified as a "hate crime" following an evaluation of the defendant's implicit negativity toward the victim's stigmatized group?

Many of the same considerations for selection apply for evaluation in the individual case. Making decisions about individuals based on their scores on implicit measures is fraught with uncertainty about the measurement itself and its applicability to the behavior in question. The presence or absence of implicit bias may be associated with particular behavioral outcomes, but there is uncertainty for any individual case. The absence of implicit bias does not guarantee that a behavior was not motivated by social biases, and the presence of implicit bias does not guarantee that a behavior was motivated by social biases. As such, our normative position for evaluative applications is the same as for selection applications: the present sensitivity of implicit measures does not provide adequate justification for this application in general.

*Are There Any Applications to Individuals for which the Use of Implicit Measures Is Justified?*

Despite our positive disposition about the validity of implicit measures and the use of implicit social cognition theory and evidence in policy, our preceding discussion conveys clear skepticism about the application of implicit measures to individual cases in policy.<sup>9</sup> We do not, however, rule out that such applications could be justified eventually. Moreover, we believe that there are some cases that are easier to justify, even with the present state of evidence.

In particular, applying implicit measures to individual cases might be justified when the following criteria are true. First, implicit measures are used as contributing evidence, not definitive evidence. In such cases, implicit measures would be considered in combination with many other forms of evidence, such as—in the case of clinical practice—past behavior, structured clinical interview, clinician judgment, and patient self-assessment. Second, the behavior itself is important but challenging to predict with other measures. Third, the implicit measure shows predictive validity in that circumstance, the bigger the better. And, fourth, the relative trade-offs between false positives and false negatives are acutely in favor of pursuing every means of predictive power.

Few behaviors fit these criteria. The most promising application of this type, in our view, is the use of implicit measures for prediction of acute psychiatric risk, particularly likelihood of committing suicide. Predicting suicidal behavior

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<sup>9</sup> Applications to classes of people carry somewhat different considerations, but we do not develop that here.

is difficult (Busch, Fawcett, & Jacobs, 2003; Nock & Banaji, 2007a,b). Nock and colleagues have accumulated evidence that implicit measures associating, for example, the self with life versus death, predict intent to harm the self and, more importantly, future suicide attempts (Nock & Banaji, 2007a,b; Nock et al., 2010; see also Glashouwer et al., 2010). In particular, “the implicit association of death/suicide with self was associated with an approximately 6-fold increase in the odds of making a suicide attempt in the next 6 months, exceeding the predictive validity of known risk factors (e.g., depression, suicide-attempt history) and both patients’ and clinicians’ predictions” (Nock et al., 2010, p. 511). Presently, this holds the most promise for implicit measures assisting decision making in individual cases, because (1) many sources of evidence are pooled in consideration of suicide risk and acute clinical care; (2) existing measures for identifying suicide risk are relatively ineffective; (3) evidence suggests that implicit measures add substantial predictive accuracy for suicide attempts; and (4) the trade-off between taking extra precautions for a person incorrectly identified as being at risk for suicide versus reducing the risk that someone fails to be identified as at risk and then commits suicide is strongly tilted toward the latter.

As with all cumulative science, the relevant evidence that informs the merits of using implicit measures may change as evidence accumulates. Ultimately, any application of psychological measures in policy is a value judgment based on an assessment of the trade-offs and goals of the policy. Scientific evidence can contribute to informing about the likely (or unlikely) success of the policies, but it cannot make irrelevant the use of values to decide what should be done.

### **Broader Considerations: Using Basic Science to Inform Public Policy**

Basic researchers often adopt a defensive crouch on the application of their research to policy. Common protestations include “we do not yet know enough to say anything about application” and “there is too much uncertainty to say anything useful” (Gardner, Scherer, & Tester, 1989). Such concerns may lead basic researchers to avoid saying anything at all.

This is unfortunate. Policy decisions are being made today. If the basic scientist, the person most expert on the problem, is unwilling to contribute knowledge or critique proposed applications, then what is the basis of the implementation? In the absence of scientific evidence, practitioners’ intuitions, folk theories, ideologies, and assumptions will fill the void to determine policy. We argue that the scientist’s responsibility is to represent the existing state of knowledge as accurately and informatively as possible: uncertainties, cautions, and all. The scientist should not decide when scientific evidence is ready to be shared or declare a moratorium on application until the problem is solved. After all, how many scientific papers end

with the phrase “no more research is necessary”? (The answer is zero.)<sup>10</sup> Policy formulation does not demand the absolute truth; it demands the best available evidence (Goodman, Levine, & Melton, 1992). As Bazelon (1982) admonished, “Do not think. . . that the system will be any more humane in your absence.”

Simultaneously, the basic scientist must appreciate her own limits of knowledge and avoid overstepping. The scientist is responsible for representing the state of knowledge, but the practitioner is responsible for considering the knowledge, its uncertainties, and the context of application to make the best possible policy decisions (Bazelon, 1982; Schauer, 2009). Because basic scientists are accustomed to experimental control and isolating targeted variables, they sometimes fail to appreciate the complex context of policy application. Basic scientists may overestimate the potency of their favorite variables in the real world, in which there are many moderating and intervening influences that were not varied experimentally. Application of basic science to policy is messy, making it quite reasonable for the fastidious basic scientist to worry about contamination. However, life does not wait for the basic scientist; real social problems are immediate and urgent. Without scientific theory and evidence, policy formulation will still proceed. Bazelon (1982) offered cogent wisdom about the scientist’s contribution to policy:

“The public arena . . . is a place where awesome decisions must be made on the basis of limited knowledge and groping understanding. The mindset I urge you to bring to the public arena should therefore combine the scientist’s ease in admitting uncertainty and the clinician’s tolerance of pragmatic decision-making. It should combine the scientist’s rigor with the clinician’s appreciation of the broader human context. I know that this is a tall order, but I also know that nothing else is acceptable” (p. 119–120).

### **Concluding Comments: Generalization in Science and to Policy**

Empirical reports do not include statements like “These findings were observed under these particular conditions with this particular sample in this setting at this point in history, but they will never be observed again and have no implications beyond characterizing that moment in time for its own sake.” All empirical research is generalized beyond the original data and findings. When making generalizations, scientists ask: “to what extent does the evidence generated from a given demonstration apply to anything other than the demonstration itself?” This question is critically important for the bridge between scientific evidence and policy applications.

One aspect of generalization addresses the conditions under which the findings from one study can be replicated in another study. When a study demonstrates a statistically significant result, researchers usually assume that the same result

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<sup>10</sup> The phrase does appear in a few articles—almost entirely to point out that it never appears in articles, or that it is not the basis for deciding when science is ready to be applied (e.g., Fulero, 1986; Kitchell et al., 2006).

would recur if a second study replicated critical elements of that investigation. The generalizability challenge is to identify the “critical elements.”<sup>11</sup>

Imagine, for example, a study measuring how far participants choose to sit from another person. The researchers randomly manipulate the person to be either thin or obese and find a reliable difference—people sit farther away from an obese person than a thin person (similar to Bessenoff & Sherman, 2000). Which features of the study cause the finding? Would the same effect be observed with blue or pink walls, in January as in May, if the confederates wore pants instead of shorts, or if the chairs were stools instead? It would be quite surprising if the finding did not generalize across such variations. However, that does not mean that it can be generalized across all circumstances.

It is impossible to test more than a trivial number of the infinite variety of social circumstances. As such, qualitative considerations like logic, reasoned argument, and existing knowledge play a substantial role in identifying the boundaries of acceptable generalization. Would the same effect be observed (1) with participants who differed from original participants in age, education, or weight status; (2) if social proximity were assessed by willingness to touch, as opposed to seating distance; (3) after establishing a particular mindset in participants, such as screening Martin Luther King Jr.’s “I Have a Dream” speech immediately prior to the key measurement? In these cases, common intuitions suggest that variation could exert important influences on the original effect. But, because social circumstances vary infinitely, generalization is the default presumption. Qualitative considerations identify plausible constraints or moderating influences, and scientific research progresses by evaluating the plausible moderating influences.

This discussion is situated in the conducting of scientific research, but the same considerations apply to the translation of scientific findings to policy application. Most scientific research does not look anything like real-life policy. Scientific research settings are artificial; the measures are different than the behaviors that occur in practice; and the participant samples are not the ones who are directly affected by the policy practices. It is rare to find research on the policies as practiced, in the settings that they are practiced, and with the people that are practicing them. Even when this is done, a committed skeptic can still identify many differences between the research findings and the exact policy circumstances under consideration.

In most cases, however, the question of generalization does not concern the research design, procedure, and measures themselves. The question is whether the psychological processes that are identified are likely to be operating in the other settings as well. Mook (1983) provides illustration of this point by considering a visit to the optometrist. It is patently obvious that the procedures and practices during an eye appointment do not occur in real life. The goal is not to see how

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<sup>11</sup> Another issue for replicability is the possibility that the original finding was a false positive; the test of statistical significance suggested that the effect did not occur by chance.

well you will identify light flashes looking into a minidome with an eye patch over one eye when you confront that same situation in the course of your daily activities. Instead, these procedures are designed to isolate and clarify the health and operation of the visual system. It is not the eye exam procedures themselves that are generalized; it is the findings and processes that are revealed by those procedures.

Reasonable people can disagree on the plausibility of particular threats to generalization, but accumulation of evidence can make some factors much less plausible than others. For policy application, the scientist's job is to outline the relevant evidence, identify the status of uncertainty in the findings, and clarify—as best as the evidence can suggest—the opportunities and threats to generalizability between the basic results and the proposed application.

In this review, we summarized the state of the evidence for implicit social cognition's role in human behavior. This research provides (1) general principles that can and should inform the design of behaviorally realistic social policies; and (2) evidence that ordinary practices in law, health, and organizational behavior may not align goals and values with ultimate behavior. Effective application of implicit social cognition will be enhanced dramatically by bridging basic science with development and evaluation of possible applications. When this basic and applied work is available, the policy implications of implicit social cognition can move from general considerations to specific recommendations.

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BRIAN NOSEK received a Ph.D. in from Yale University in 2002 and is an associate professor in the Department of Psychology at the University of Virginia. In 2007, he received early career awards from the International Social Cognition Network (ISCON) and the Society for the Psychological Study of Social Issues (SPSSI). He directs Project Implicit (<http://projectimplicit.net/>) an Internet-based multi-university collaboration of research and education about implicit cognition – thoughts and feelings that exist outside of awareness or control. Nosek’s research interests concern the gap between values and practices with applications in implicit cognition, automaticity, social judgment and decision making, attitudes and beliefs, stereotyping and prejudice, ideology, morality, and scientific practices.

RACHEL RISKIND received her M.A. from the University of Virginia in 2009 and is currently a PhD candidate, also at the University of Virginia. She received a dissertation fellowship to support her research on psychological barriers to parenthood among lesbian and gay adults. Her research focuses on implicit social cognition, social climate, and predictors of parenthood as they relate to sexual orientation.