Implicit Measures of Social Cognition
Common Themes and Unresolved Questions

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One of the guiding themes in social psychology is that individuals' perceptions, judgments, and evaluations are often shaped by psychological processes that bypass their awareness, intention, or control and thus cannot be fully articulated in self-reports. Metaphorically speaking, these thoughts and feelings (broadly referred to as implicit social cognitions) are like a computer's operating system running invisibly in the background while other applications run in the foreground (i.e., explicit thoughts and feelings that can be articulated). In the past two decades, we as a field have been fascinated with the nature, benefits, and limits of implicit beliefs and attitudes. Empirical publications on this topic proliferated sharply after 1986 when two influential articles were published that translated theoretical ideas about less-than-conscious attitudes into empirical tests – one of these articles was by Fazio, Sanbonmatsu, Powell, and Kardes (1986), and another was by Dovidio, Evans, and Tyler (1986). These two papers gave the field initial traction into the until-then murky terrain of measurement.

In the 23 years since then, the number of implicit measures has proliferated (for a review see Dasgupta, 2004). With the growing number of measures and empirical demonstrations of implicit social cognition, numerous measurement questions have arisen: if attitudes and beliefs operate implicitly, how might we measure them? How good are these measures? How do they relate to explicit attitude measures? What do responses on these measures predict further downstream? Essentially, these are questions about specific measures' internal consistency, reliability, construct validity, discriminant validity, and predictive validity.

This special issue of *the Journal of Psychology* has gathered together a collection of empirical papers that address some of these questions. Collectively, these papers measured implicit responses toward a variety of different attitude objects – social groups, the self-concept, nonhuman living creatures, nonsocial consumer products, and risky activities. They also used at least eight different types of implicit measures (Evaluative Priming Task, Implicit Association Test – IAT, Single-Category IAT, Lexical Decision Task, Extrinsic Affective Simon Task, Evaluative Movement Assessment, Approach Avoidance Task, and Semantic Misattribution Procedure).

In this brief commentary, I will highlight three themes that emerged from this collection of papers and identify three unresolved questions in the hope that they will be pursued in the next generation of research on this topic.

Common Themes Across Multiple Papers

Theme #1: Predictive Validity of Implicit Measures

Several papers in this special issue tested whether perceivers' implicit and explicit responses toward various attitude objects predict different kinds of behavior. Focusing on the self-concept, Rudolph, Schröder-Abé, Riketta, and Schütz (2010) showed that two implicit measures of self-esteem predicted indirectly assessed anxious behaviors (e.g., word use in extemporaneous speech, experimenter ratings of anxiety, and spontaneous nonverbal behavior) whereas several explicit measures of self-esteem predicted directly assessed anxious behavior (e.g., self-reported anxiety and deliberate nonverbal behavior).

In the domain of risk-taking, Dislich, Zinkernagel, Ortner, and Schmitt (2009) examined whether implicit versus explicit perceptions of risk captured by several measures would differentially predict different types of risk-taking behavior – impulsive risk-taking and deliberative risk-taking. They found that one of the implicit measures of risk-taking (but none of the explicit measures) predicted impulsive risk-taking behavior. In mirror-image fashion, two of the explicit measures of risk-taking (but none of the implicit measures) predicted reflective risk-taking behavior. Having self-control reduced the magnitude of correlation between implicit risk-taking and impulsive behavior; in an analogous fashion, having self-control amplified the magnitude of correlation between explicit risk-taking and reflective risk-taking.

In the domain of consumer attitudes and behavior, Summerville, Hsieh, and Harrington (2010) sought to identify which types of implicit reactions toward consumer products would best predict people's intentions to buy those products. They found that a measure tapping implicit emotions evoked by consumer products predicted participants' buying intentions significantly better than their general implicit attitudes

toward those products. Interestingly, this finding nicely parallels the intergroup emotions literature which also makes the case that the specific emotions people feel toward various outgroups predict their action tendencies toward those groups better than global evaluations, probably because emotions are more tightly linked to specific goal-directed action tendencies compared to global evaluations. Summerville et al.'s (2010) finding in the consumer behavior domain provides nice convergence with the intergroup emotions work.

In the domain of arachnophobia, Reinecke, Becker, and Rinck (2010) examined whether three measures capturing people's implicit attitudes toward spiders would predict the speed with which they approached a spider. They found that for all three measures, the more people exhibited negative implicit attitudes toward spiders the more slowly they approached a spider's cage.

Theme #2: Discriminant Validity of Implicit Measures

Blair, Judd, Havranik, and Steiner (2010) reasoned that the direction and magnitude of people's preference for particular social groups ought to depend on both: (a) people's own group membership in the target groups that are the attitude objects of interest and (b) the relative social status of the target groups. If implicit measures are to be successful at capturing people's implicit group preferences, they ought to be sensitive to participants' own social identity and the target group's status in society. Such evidence would constitute support for a measure's discriminant validity. To test this hypothesis, Blair et al. (2010) recruited three participant groups (Latinos, African Americans, and Whites) and measured their attitudes toward the same three groups using IATs. As predicted, they found that for the Black-White IAT, Black participants (a low status group) showed the least bias against their ingroup, White participants (a high status group) showed the most bias, and Latino participants (a low status group, but one whose ingroup was not represented in this IAT) exhibited implicit preferences that fell between the other two groups. The Latino-White IAT revealed mirror-image results with Latinos showing the least bias, Whites the most bias, and Black participants were in the middle. Also in support of discriminant validity, correlations between implicit and explicit measures were stronger when they focused on the same target group than when they focused on different target groups.

In part, implicit attitudes are driven by the degree to which people associate the attitude object with the self, which is a point made by Popa-Roch and Delmas (2010). The more perceivers associate the self with an attitude object (i.e., a specific target group), the more their data ought to reflect implicit liking for that attitude object (social group). To test that idea Popa-Roch and Delmas (2010) trained participants to associate the self with an outgroup and found that such training reduced implicit bias against that outgroup. Although the authors framed this finding as a methodological weakness of the IAT, which was the measure they used, I interpret this finding to be perfectly consistent

with past evidence in the prejudice literature which shows that the less similar people feel toward an outgroup, the more prejudice they express. Thus, it makes perfect sense that manipulating the degree of similarity will affect the magnitude of implicit prejudice. However, as shown by the Blair et al.'s paper, besides similarity to the self, a target group's status in society also affects participants' implicit attitudes even if they do not belong to that group (and thus do not see themselves as similar to it).

Theme #3: Implicit and Explicit Attitudes Represent Two Independent Constructs, Not One

Coming at this issue from different angles, several of the papers in this collection made the point that implicit and explicit measures capture independent (but partially correlated) psychological constructs. For example, in the domain of self-esteem, using structural equation modeling Rudolph et al. (2010) showed that implicit and explicit self-esteem were best represented as two independent latent constructs (not as a single construct) that predicted indirect and direct types of anxious behavior, respectively. Using different methodology Summerville, Dislich, Reinecke, and their respective colleagues came to the same conclusion after finding that correlations between implicit attitudes and subtle behaviors are stronger than those between implicit attitudes and overt behaviors. Similarly, correlations between explicit attitudes and overt behaviors are stronger than those between explicit attitudes and indirect behaviors.

The Next Generation of Unresolved Questions

These papers also surface some of the unresolved questions about implicit measures in particular and implicit social cognition more generally. Below, I highlight three such questions in the hope that they will be productive avenues of future research.

When Do Implicit Measures of the Same Attitude Object Hang Together Versus When Are They Uncorrelated?

Several of the reported studies used multiple implicit measures to tap participants' sentiments toward the same attitude object. Results showed that these implicit measures were either only modestly correlated or, in some cases, completely uncorrelated (e.g., Dislich et al., 2010; Reinecke et al., 2010; Rudolph et al., 2010; Summerville et al., 2010). This raises the question: does the weak-to-null correlation capture measurement differences or meaningful theoretical differences between implicit measures? This question is an important one that needs to be systematically addressed in the future.

The Connection Between Implicit Measures and The Definition of Implicit Social Cognition

All the papers in this special issue used implicit measures that were based on response latency. This type of measurement assessing how quickly one concept is associated with a particular attribute, evaluation, etc., rests on the idea that implicit attitudes/beliefs are thoughts or evaluations that pop into mind quickly and automatically without control or intention. But the logic driving these reaction time-based measures is typically agnostic about whether or not participants are aware of the attitudes under investigation while completing the task. The assumption is that because these tasks require rapid responses, even if participants become semi-aware of the attitude being measured, they cannot easily control their responses.

One fruitful avenue of future research would be to focus more attention on developing and testing tasks that measure implicit attitudes and beliefs without participants being aware of the object under investigation. After all, an integral part of the definition of implicit attitudes that tends to be neglected in recent empirical work refers to *thoughts and feelings that operate without perceivers' awareness* (Banaji & Dasgupta, 1998; Bargh, 1994; Greenwald & Banaji, 1995; Nisbett & Wilson, 1977). One might argue that in most of the studies in this special issue participants may have been reasonably aware of their responses although they may not have had the opportunity to control them. Would these results look similar or different had these studies used alternative implicit measures that tapped participants' sentiments without their awareness (vs. their control)?

Does the Use of Specific Attitude Objects Moderate the Robustness of Results Yielded by Implicit Measures?

Collectively, the present studies measured implicit reactions toward a vastly diverse array of attitude objects – social groups, the self-concept, nonhuman living creatures, consumer products, and risky activities. How well each implicit measure performs is likely to be influenced, at least in part, by the type of attitude object that was the focus of this investigation. Attitude objects that evoke highly elaborated versus weakly elaborated thoughts; that are important versus unimportant to the self; that arouse high versus low social desirability concerns or strong versus weak emotions are all likely to moderate and change the performance of implicit measures in terms of their predictive validity and convergent validity with explicit measures. This issue has only been examined in two empirical papers specifically in relation to the IAT (Greenwald, Poehlman, Uhlmann, & Banaji, 2009; Nosek, 2005) and needs to be investigated for other implicit measures as well.

In conclusion, this special issue with its collection of empirical papers offers a nice resting place to stop, look back, and reflect on what we know (so far) about implicit measures and the attitudes and beliefs they seek to capture and what there is yet to learn.

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