The Problem of the Null in the Verification of Unconscious Cognition

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(Commentary on Newell and Shanks,

"Unconscious Influences on Decision Making: A Critical Review")

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Abstract

Newell and Shanks argue that when awareness measures are more reliable and valid, greater evidence of awareness of supposedly unconscious influences is revealed. A related issue is that unconsciousness is typically the null hypothesis that evidence of awareness will *not* emerge. As it is difficult to conclude the null, it is also difficult to conclude a lack of conscious awareness.

Traditional theories hold that human beings make decisions consciously and intentionally. In contemporary cognitive science, this traditional perspective has been challenged by research pointing to an important role for unconscious influences in decision making. Newell and Shanks (in press) provide a methodological critique of some of the major bodies of literature on unconscious cognition. As they argue, when awareness probes are more reliable, relevant, immediate, and sensitive, greater evidence of conscious awareness is sometimes revealed. Thus, at least some findings used to argue for unconscious influences on decision making may result from shortcomings of commonly used measures of conscious awareness.

This point also applies to some areas of research on implicit and automatic cognition not addressed by Newell and Shanks (in press). Uhlmann, Pizarro, and Bloom (2008) raised similar concerns about methodological limitations potentially shrouding evidence of awareness of the automatic associations measured by tasks like the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998). Early studies finding negligible correlations between self-reported attitudes and IAT scores led to the conclusion that the latter measured attitudes of which the person was not consciously aware. However, subsequent studies reveal robust implicit-explicit correlations after correcting for random measurement error (Cunningham, Nezlek, & Banaji, 2004; Cunningham, Preacher, & Banaji, 2001) and when more relevant self-report measures are used (e.g., asking the person to report their automatic gut feelings rather than their explicit attitudes; Ranganath, Smith, & Nosek, 2008; Smith & Nosek, 2011). Moreover, correlations between self-report and implicit measures are higher in domains that are less socially sensitive (e.g., consumer as opposed to racial attitudes, Nosek, 2005), for participants unmotivated to conceal their true attitudes (Banse, Seise, & Zerbes, 2001; Dunton & Fazio, 1997; Fazio et al.,

1995; Payne, 2001; Payne et al., 2005), and when respondents are encouraged to be honest in their self-reports (Olson, Fazio, & Hermann, 2007). This suggests people are at least partly aware of their automatic associations, but that insufficiently reliable, sensitive, and relevant measures often obscure this fact (Uhlmann et al., 2008).

This reflects not just methodological limitations of the measures involved, but also the broader problem with operationalizing unconsciousness as a null effect (as is done in most research on unconscious cognition). When post-hoc debriefings do not uncover evidence of awareness, or a correlation between a self-report measure and implicit measure fails to emerge, such null effects are used to conclude a lack of conscious awareness. This would be less problematic if we knew *a priori* that the measure of awareness is perfectly valid. However, how does one really know whether an awareness measure is reliable, relevant, sensitive, and immediate enough? Such measures are most self-evidently valid when they uncover some evidence of conscious awareness. But when they do not, should we then conclude the null (i.e., a lack of conscious awareness), or worry that the measures involved are not good enough? Equating unconsciousness with the null also leaves the findings vulnerable to criticism. A skeptic can always argue (in some cases post-hoc) that the awareness measure was insufficiently relevant, reliable, immediate, or sensitive.

Importantly, there is considerable evidence of unconscious influences on decision making that is *not* dependent on null effects. For instance, research on the effects of "reasons analyses" shows that asking people to provide reasons for their attitudes leads them to report different attitudes, suggesting that they do not actually know what the real reasons for their attitudes are (Wilson &

LaFleur, 1995; Wilson, Dunn, Bybee, Hyman, & Rotondo, 1984; Wilson, Dunn, Kraft, & Lisle, 1989). Newell and Shanks (in press) argue that reasons analyses may lead participants to incorporate additional information they had not considered before and therefore change their attitudes, but offer no evidence that this actually occurs. Moreover, it is unclear why consciously incorporating previously unconsidered information would reduce attitude-behavior consistency and post-choice satisfaction if the influence of the new information (and resulting attitude change) is genuine. Thus, the effects of reasons analyses are more consistent with a lack of full introspective access into the true influences on one's attitudes.

In addition, the effects of unobtrusively presented primes (e.g., words related to competition) on relevant judgments and actions (e.g., competitive behavior) has been replicated in scores of studies (for reviews, see Bargh, 2006; Bargh, Schwader, Hailey, Dyer, & Boothby, 2012; DeCoster & Claypool, 2004; Wheeler & DeMarree, 2009). Indicating such influences occur primarily when participants are unable to consciously resist them, priming effects have been shown to attenuate or even reverse when study participants suspect they are being influenced (Lombardi, Higgins, & Bargh, 1987; Newman & Uleman, 1990) or their awareness of the primes is experimentally increased (Erb, Bioy, & Hilton, 2002; Newman & Uleman, 1990; Strack et al., 1993). If increased awareness reduces priming effects, then assimilation to primes is almost certainly unconscious. The case that people are unaware of the influences of primes on their judgments and behaviors does not rest solely on null effects.

As highlighted by Newell and Shanks (in press), the criteria currently used to demonstrate unconscious cognition are worth critiquing and debating. However, it is worth discussing not

only the criteria for concluding an influence on decision making is unconscious, but also for concluding it is conscious. When strong evidence of unconscious cognition is unavailable, researchers should not assume conscious awareness by default. Rather, awareness should be demonstrated empirically. A liberal criterion is a statistically significant relationship between an awareness probe and the phenomenon of interest. A conservative criterion is that an effect only emerges among participants who report being consciously aware of it. Regardless of what criteria the field ultimately settles on, it is critical that the burden of proof for concluding consciousness and unconsciousness be equally difficult to meet.

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