

A public versus private administration of the implicit association test

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Abstract

This research includes two experiments that examined (a) whether the assessment situation in which individuals complete an implicit measure of bias alters their responses and (b) whether the hypothesized effect of the assessment situation on implicitly assessed bias reflects socially desirable responding. Participants in Experiment 1 (N = 151) completed an IAT measuring bias toward homosexuality in either a public or a private assessment situation. Consistent with studies of explicitly assessed attitudes, implicitly assessed bias toward homosexuality was significantly lower when assessed in a public versus a private assessment situation. Participants in Experiment 2 (N = 102) completed an IAT measuring bias toward homosexuality in a public assessment situation under a bogus pipeline or no-bogus pipeline condition. Results indicated that participants' implicitly assessed bias did not significantly differ across these conditions. The authors discuss these findings in terms of possible automatic processes affecting the malleability of implicitly assessed attitudes. Copyright © 2006 John Wiley & Sons, Ltd.

Implicit measures of attitudes are a revolutionary component of research on prejudice because they have the potential to assess attitudes that people are unwilling or unable to consciously report (Greenwald & Banaji, 1995). Greenwald, McGhee, and Schwartz (1998) provided a dramatic illustration of this point when they showed that White participants endorsed positive or neutral attitudes toward African-Americans on an explicit measure but exhibited negative attitudes toward African-Americans on an implicit measure. These results have subsequently been replicated (Ottoway, Hayden, & Oakes; 2001), and have been extended to include attitudes toward a variety of social groups such as Hispanics (Ottoway et al., 2001), Turks (Neumann & Seibt, 2001), elderly people (Nosek, Banaji, & Greenwald, 2002), and homosexuals (Banse, Seise, & Zerbes, 2001; Steffens & Buchner, 2003).

MODERATORS OF IMPLICITLY ASSESSED ATTITUDES

Implicitly assessed attitudes were originally conceptualized as automatic and uncontrollable (Devine, 1989). According to this conceptualization, attitudes assessed by implicit measures should be less

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susceptible to many of the factors that are known to have an unwanted influence on the attitudes assessed by explicit measures. If that were true, implicit measures would have a major advantage over explicit measures (Fazio, Jackson, Dunton, & Williams, 1995). However, an accumulating body of evidence indicates that implicitly assessed attitudes are influenced by various cognitive, motivational, and situational factors (Blair, 2002). The malleability of implicitly assessed attitudes is theoretically important because it suggests that implicit measures may be susceptible to some of the same sorts of unwanted influences to which explicit measures are susceptible.

One factor that has been reliably found to have an unwanted influence on explicitly assessed attitudes is the assessment situation. People consistently report more positive attitudes toward stigmatized groups on explicit measures when they complete those measures in a public versus a private assessment situation (e.g., Blanchard, Crandall, Brigham, & Vaughn, 1994; Plant & Devine, 1998). If implicit measures are susceptible to some of the same unwanted influences that explicit measures are susceptible to, then they too should be influenced by the assessment situation, especially given its robust effects on explicitly assessed attitudes. Support for this hypothesis would provide evidence that implicit measures have some of the same disadvantages as explicit measures and that they should not be conceptualized as being the more valid of the two (Blair, 2002; Nosek, Greenwald, & Banaji, *in press*).

EXPLANATIONS FOR DIFFERENCES IN PUBLICLY AND PRIVATELY ASSESSED ATTITUDES

Explicitly measured attitudes toward stigmatized groups are more positive when assessed in a public situation than when assessed in a private situation due to people's motivation to appear unprejudiced to others (Plant & Devine, 1989). The possibility that the assessment situation may also alter implicitly assessed attitudes raises questions about the underlying process that might produce such an effect. According to Fazio and Olson (2003), most studies of implicitly assessed attitudes are not implicit in the strictest sense because the measures require processing of explicit information and individuals are often aware of the attitudes being assessed. Thus, Fazio and Olson suggest that the measures are implicit while the attitudes may not be. According to this line of reasoning, the attitudes assessed by implicit measures may be partly under voluntary control. Consistent with this perspective, recent evidence suggests that individuals can exert some control over implicitly assessed attitudes. For example, individuals who took the implicit association test (IAT; Greenwald et al., 1998) were able to control their responses when they had experience with the measure (Steffens, 2004) and when they had been given explicit information about faking strategies (Kim, 2003). Although the ability of individuals to exert voluntary control over their implicitly assessed attitudes does appear to have limits (Asendorpf, Banse, & Mücke, 2002; Banse et al., 2001; Kim, 2003; Steffens, 2004), the fact that effortful control occurs at all suggests that people may be able to alter their responses on implicit measures in a socially desirable manner.

Implicit measures were initially seen as a possible way to avoid socially desirable responding by circumventing voluntarily controlled response patterns (Greenwald et al., 1998). For example, in their review of implicit measures used in social cognition research, Fazio and Olson (2003) state that:

What these various approaches have in common is that they all seek to provide an estimate of the construct of interest without having to directly ask the participant for a verbal report. Their major appeal is that these indirect estimates are likely to be free of social desirability concerns. (p. 300)

If people can exert voluntarily control over attitudes on implicit measures, then they, like explicit measures, may be susceptible to conscious attempts to misrepresent one's true attitudes in a socially desirable manner, i.e., faking. However, simply finding support for the hypothesis that people show more positive attitudes toward stigmatized groups on implicit measures when those measures are given in a public versus a private assessment situation does not necessarily mean that people consciously altered their responses in a socially desirable manner. Blair (2002) has proposed that the malleability of attitudes assessed with implicit measures occurs in response to changes in automatic processing. According to this perspective, the influence of the assessment situation on implicitly assessed attitudes occurs outside of people's awareness and thus does not directly reflect conscious efforts to provide socially desirable responses.

OVERVIEW OF RESEARCH AND HYPOTHESES

The present research examines whether a public assessment situation alters implicitly assessed attitudes in much the same way that it alters explicitly assessed attitudes and whether the hypothesized effect of the assessment situation on implicitly assessed attitudes is the result of conscious efforts to provide socially desirable responses. To test whether the assessment situation influences implicitly and explicitly assessed attitudes in a similar way, participants in Experiment 1 completed implicit and explicit measures of bias toward homosexuality in either a public or a private assessment situation. Participants in the public assessment situation believed that the experimenter would know their level of bias toward homosexuality whereas participants in the private assessment situation believed that the experimenter would not know their level of bias. We predicted that bias toward homosexuality would be lower in the public than in the private assessment situation on both the implicit and explicit measures. Then, in Experiment 2, we considered whether the expected influence of the assessment situation on implicitly assessed attitudes reflected socially desirable response patterns that are under voluntary control. To this end, participants in Experiment 2 completed an IAT measuring bias toward homosexuality in a public assessment situation believing that the experimenter either would or would not be able to detect whether they had responded truthfully.

EXPERIMENT 1

Experiment 1 is designed to examine whether the assessment situation in which people complete a measure of bias has the same effect on implicitly assessed bias as it has on explicitly assessed bias. We hypothesized that bias would be lower on both types of measures when those measures are given in a public versus a private assessment situation. Such results would be consistent both with research on the effect of conscious motivation to conceal prejudice in public (Plant & Devine, 1998) and Blair's (2002) model of automatic activation of associated constructs that explains malleability of implicitly assessed attitudes through unconscious processes.

Method

Participants

Participants were 151 undergraduates (51 men, 100 women) enrolled in psychology courses at a large Midwestern university who participated in the experiment in exchange for extra credit in their

psychology class. Participants were 85% White, 8% Asian, 4% African-American, 2% Hispanic, and 1% who designated themselves as 'other.' The average age of participants was 19.6 years. No participant reported a sexual orientation that was primarily bisexual or homosexual.

Experimental Design

Participants were randomly assigned to complete an IAT regarding their attitudes toward homosexuality in either a public assessment situation ($n = 76$) or a private assessment situation ($n = 75$). Following the methods of previous research (Plant & Devine, 1998), participants in the public assessment situation (public condition) believed that the experimenter would examine their scores on all of the measures of bias they would complete during the experimental session and would, therefore, be privy to their level of bias toward homosexuality. Participants in the private assessment situation (private condition), in contrast, believed that the experimenter would not examine their scores on any of the bias measures they would complete during the experimental session, thereby allowing their level of bias toward homosexuality to remain private.

Measures

Participants completed one implicit measure of bias toward homosexuality, two explicit measures of bias toward homosexuality, and a survey that assessed demographic information pertaining to gender, age, and sexual orientation.

Implicit Measure of Bias The IAT was designed to assess implicit attitudes by examining the extent to which individuals associate concepts with evaluative attributes (Greenwald et al., 1998). The current study assesses the extent to which the concepts of gay and straight are associated with the evaluative attributes of good and bad. Consistent with past research (Banse et al., 2001), the concept of gay was represented by 10-photos of same-sex couples including five female–female couples and five male–male couples, and the concept of straight was represented by 10-photos of opposite-sex couples. The evaluative concepts of good and bad were represented by 10 pleasant and 10 unpleasant words taken from Greenwald et al. (1998). The IAT consisted of three practice tasks to learn the stimuli and two critical tasks. In one critical task, participants made evaluatively compatible responses by responding to the same-sex couples and unpleasant words by pressing one computer key (Gay + Bad), and to the opposite-sex couples and pleasant words by pressing a different key (Straight + Good). In the other critical task, participants made evaluatively incompatible responses by responding to both the opposite-sex couples and unpleasant words with one computer key (Straight + Bad), and to both same-sex couples and pleasant words with a different key (Gay + Good). The practice tasks consisted of 40 individual responses while the critical tasks consisted of 80 responses. Consistent with past research (Greenwald, et al., 1998), the order of trials was counterbalanced to control for order effects.

Explicit Measures of Bias The explicit measures of bias were the Index of Homophobia (Hudson & Ricketts, 1980) and the Heterosexism Scale (Park & Bieschke, 2002). The Index of Homophobia is a measure of bias toward homosexuality that is related to conservative sexual attitudes (Hudson & Ricketts, 1980), number of close relationships with gays and lesbians (Barrett & McWhirter, 2002), and comfort working with gay men (Crawford, Humfleet, Ribordy, Ho, & Vickers, 1991). The measure showed high internal consistency in the current sample ($\alpha = 0.90$). The Heterosexism Scale is a more subtle measure of bias toward homosexuality. The validity of the Heterosexism Scale has been demonstrated by its relation to attitudes toward ethnic minorities and homophobia and its lack of relation to social desirability (Park & Bieschke, 2002). The measure showed high internal consistency in the current sample ($\alpha = 0.92$).

Procedure

After providing their informed consent, all participants were told that they were about to take a measure of bias toward homosexuality on a computer. Participants assigned to the public condition were further told that the experimenter would examine their score after they had completed the measure and would, therefore, know their level of bias toward homosexuality. By contrast, participants assigned to the private condition were told that the experimenter would not examine their score after they had completed the measure, with the implication being that the experimenter would not know their level of bias toward homosexuality. All participants were then informed that in the upcoming task all of the same sex couples they would see were gay and all of the opposite sex couples they would see were straight. Participants then began an IAT. After completing the IAT, participants completed the Index of Homophobia and the Heterosexism Scale. Participants in the public condition verbally reported their responses to the experimenter who recorded them. Participants in the private condition completed pen and paper surveys in private. Following the surveys, all participants provided demographic information after which they were debriefed and dismissed.

Results and Discussion

Data Reduction

The reaction time data was measured in milliseconds (ms). Consistent with Greenwald, Nosek, and Banaji's (2003) procedure, correct responses to stimuli were reduced by deleting all response times below 400 ms. Incorrect responses were then recoded with a time punishment, i.e., the mean ms response rate for correct responses plus 600 ms replaced errors. The average response latency was then computed for responses to the compatible (Gay + Bad and Straight + Good) and incompatible trials (Gay + Good and Straight + Bad). The *SD* of the mean of correct latencies was then used to compute the *D* score.

IAT Effect

To compute the IAT effect, the average transformed ms response speed of the compatible responses (Gay + Bad and Straight + Good) was subtracted from the average transformed ms response speed of the incompatible responses (Gay + Good and Straight + Bad). Positive IAT effects indicate a bias toward homosexuality (Greenwald et al., 1998). In order to test the statistical significance of the IAT effect, the critical trials were subjected to a repeated measures *t*-test. As expected, participants took significantly longer when making incompatible (*Gay + Good and Straight + Bad*) versus compatible (*Gay - Bad/Straight-Good*) responses, $t(152) = 5.07$, $p < 0.001$, $d = 0.48$, suggesting that participants were biased toward homosexuality. In addition, although the more subtle Heterosexism Scale was not significantly correlated with the IAT, $r = 0.15$, $p > 0.05$, a small but significant relationship between participants' IAT effect and the Index of Homophobia was found, $r = 0.22$, $p < 0.01$.¹ Both the presence of an IAT effect and its small correlation with an explicit measure of bias toward

¹We also examined the relationship between the IAT effect and the explicit measures separately by condition. The correlation was significant in the private assessment condition, $r = 0.25$, $p < 0.01$, but not in the public assessment condition, $r = 0.17$, $p > 0.05$. In addition, the Heterosexism Scale was not significantly correlated with the IAT in the private, $r = 0.18$, $p > 0.05$, or public conditions, $r = 0.06$, $p > 0.05$. However, it is often the case that explicit measures and implicit measures are uncorrelated (Greenwald et al., 1998).

homosexuality provide evidence for the validity of the current study's IAT (Banse et al., 2001; Steffens & Buchner, 2003).

Main Analysis

We used independent samples *t*-tests to examine the hypothesis that bias toward homosexuality would be significantly lower in a public versus a private assessment situation. We first examined whether participants' responses to the explicit measures of bias differed across the public and private conditions. As expected, results indicated that scores on the Heterosexism Scale were significantly lower in the public ($M = 45.57$) versus the private ($M = 50.53$) condition, $t(151) = 2.16$, $p = 0.032$, $d = 0.35$. The same pattern emerged with respect to participant's scores on the Index of Homophobia (Public: $M = 71.70$; Private: $M = 75.07$), although in this case the difference was not statistically significant $t(151) = 1.38$, $p = 0.17$, $d = 0.22$ (Table 1). These findings replicate past work demonstrating that explicitly measured attitudes of stigmatized groups become less biased when they are assessed in a public and a private assessment situation (Blanchard et al., 1994; Plant & Devine, 1998).

We next examined whether participants' responses to the implicit measure of bias also differed across the public and private conditions. Consistent with the hypothesis, the IAT effect was significantly lower in the public ($M = 0.20$) than in the private ($M = 0.56$) condition, $t(151) = 2.47$, $p = 0.02$, $d = 0.40$. In fact, the IAT effect observed in the public condition was less than half of that observed in the private condition. These findings suggest that participants exhibited significantly less bias toward homosexuality in a public assessment than in a private assessment situation on both the explicit and implicit measures.

Although the results of this experiment provide evidence that a public assessment situation reduced the degree of bias that participants showed on the IAT relative to a private assessment situation, the underlying process responsible for that effect is not clear. Participants' tendency to exhibit less bias on the IAT in the public versus the private assessment situation could reflect an attempt on the part of participants to purposefully alter their responses on the IAT in public to appear unbiased. This interpretation is consistent with a social desirability interpretation and supports the conceptualization of the IAT as not fully implicit (Fazio & Olson, 2003). Alternatively, participants' tendency to exhibit less bias on the IAT in the public versus the private assessment situation could reflect automatic processes that occurred outside of their voluntary control. This interpretation is consistent with Blair's (2002) model of automatic activation of associated constructs. To explore the underlying process responsible for the effect of the assessment situation on participants' implicitly assessed attitudes, we performed a second experiment in which we manipulated participants' belief that they could misrepresent their attitudes during a public assessment of the IAT.

Table 1. Means and standard deviations for measures of bias in public and private conditions

Measure	Condition					
	Combined		Public		Private	
	Mean	SD	Mean	SD	Mean	SD
IAT effect	0.38	0.90	0.20*	0.93	0.56*	0.84
Index of homophobia	73.39	15.13	71.70	14.10	75.07	15.99
Heterosexism scale	48.07	14.38	45.57*	12.88	50.53*	15.41

Note:*Significance difference between public and private condition means, $p < 0.05$.

EXPERIMENT 2

In Experiment 2, we examine whether the public assessment situation used in the first experiment lowered bias on the IAT because participants consciously altered their responses in a socially desirable manner to appear unbiased to the experimenter, i.e., faked their IAT responses. We examine this explanation of our findings with a bogus pipeline procedure. The bogus pipeline is an experimental procedure in which participants are led to believe that the experimenter has access to their 'true' attitudes, thus reducing participants' attempts to misrepresent their attitudes. The bogus pipeline procedure has been shown to effectively reduce socially desirable response patterns (Sigall & Page, 1971; Roese & Jamieson, 1993).

We used the bogus pipeline procedure in this experiment to minimize participants' conscious attempts to alter their responses on an IAT during a public assessment situation. If participants in Experiment 1 showed lower bias in the public versus the private assessment situation because of conscious attempts on their part to provide socially desirable responses, then the level of bias that participants in Experiment 2 show on the IAT should be higher in the bogus pipeline condition than in the no-bogus pipeline condition due to the belief that faking would not be an effective means of concealing bias in the bogus pipeline condition.

Method

Participants

Participants were 103 undergraduates (35 men, 66 women, and 2 not indicating sex) enrolled in psychology courses at a large Midwestern university who participated in the experiment to fulfill a course requirement. Participants were 87% White, 6% Asian, 4% African-American, 1% Hispanic, 1% Native American, and 1% who designated themselves as 'other.' The average age of participants was 19.9 years. Four participants identified themselves as gay, lesbian, or bisexual. Targets of bias are sometimes excluded from IAT studies (e.g., Greenwald et al., 1998) and sometimes included (e.g., Nosek et al., 2002). We chose to eliminate the four participants who indicated same sex orientations, thus, reducing the sample to 98.²

Experimental Design

Participants were randomly assigned to a no-bogus pipeline condition ($n = 51$) or bogus pipeline condition ($n = 51$). Participants in both conditions expected to have their physiological reactions measured immediately after completing an IAT. However, whereas participants in the no-bogus pipeline condition believed that their physiological reactions were being taken for the purposes of a second unrelated task, participants in the bogus pipeline condition believed that their physiological reactions would indicate whether or not they had attempted to misrepresent their attitudes toward homosexuality on the IAT.

Measures

All participants completed (1) an IAT regarding attitudes toward homosexuality in a public assessment situation, (2) a demographic survey, and (3) a manipulation check of the bogus pipeline manipulation.

² Removing these four individuals did not alter the pattern of results nor any decisions regarding statistical significance.

The IAT and demographic survey were the same as used in Experiment 1. The manipulation check asked participants to indicate their agreement with the statement 'I am nervous about being hooked up to the physiological measures' on a 1 (Strongly Disagree) to 5 (Strongly Agree) scale. We reasoned that participants in the bogus pipeline condition would be more nervous about having their physiological reactions measured for fear that it might indicate that they had attempted to misrepresent their attitudes toward homosexuality on the IAT than would participants in the no-bogus pipeline condition who believed that the physiological measures were associated with an unrelated task.

Procedures

The procedures of this study are identical to those of the public condition in Experiment 1 with the following exceptions. First, all participants completed the IAT in the presence of skin conductance electrodes and a heart rate apparatus. Second, all participants expected to have their skin conductance and heart rate measured upon completing the IAT, though none actually did (Riess, Kalle, & Tedeschi, 1981). Third, whereas participants assigned to the no-bogus pipeline condition were led to believe that the physiological measures were part of an unrelated task, participants assigned to the bogus pipeline condition were led to believe that the physiological measures would detect whether they had attempted to misrepresent their attitudes on the IAT. Fourth, after completing the IAT, all participants completed the manipulation check described above. Next, participants were probed for suspicion about the bogus pipeline after which they completed the demographic survey. Participants were then debriefed and dismissed. Three participants were excluded from analysis due to suspicion about the bogus pipeline procedure and another participant's data was lost due to computer error.

Results and Discussion

Manipulation Check

An independent samples *t*-test examined the effectiveness of the bogus pipeline manipulation by comparing how nervous participants in the no-bogus pipeline and bogus pipeline conditions indicated they were about having their skin conductance and heart rate measured. Results indicated that the bogus pipeline manipulation had the anticipated effect. Participants in the no-bogus pipeline condition reported feeling significantly less nervous about the anticipated physiological measures ($M = 1.65$; $SD = 1.40$) than did participants in the bogus pipeline condition ($M = 2.31$; $SD = 1.34$), $t(92) = 2.33$, $p = 0.02$, $d = 0.55$.

IAT Effect

Data reduction for the IAT followed the same procedure as Experiment 1. Results indicated that participants took significantly longer when making incompatible (*Gay + Good and Straight + Bad*) than compatible (*Gay-Bad/Straight-Good*) responses, $t(93) = 4.84$, $p < 0.001$, $d = 0.58$. This finding indicates a significant bias toward homosexuality.

Main Analysis

We used an independent sample *t*-test to determine if bias, as measured by the IAT effect, differed significantly across the no-bogus pipeline and bogus pipeline conditions. If participants' tendency in

Experiment 1 to show lower bias on the IAT in the public versus the private condition was due to socially desirable responding, then the bogus pipeline manipulation used in this experiment should influence participants' IAT responses such that bias would be higher in the bogus pipeline condition than in the no-bogus pipeline condition. In contrast to this hypothesis, however, results indicated that participants' IAT effect did not significantly differ across these conditions ($M = 0.62$ bogus pipeline, $SD = 1.24$ vs. $M = 0.51$ no-bogus pipeline, $SD = 1.03$), $t(92) = 0.37$, $p = 0.71$, $d = 0.10$.

Several points are worth considering when interpreting this result. First, given our preliminary finding that the bogus pipeline manipulation had been effective, it seems unlikely that this result reflects a failed manipulation. Second, the effect of the bogus pipeline manipulation on participants' implicitly assessed attitudes is very small ($d = 0.10$) and would have required over 1000 participants per cell to detect with an 80% likelihood. Third, even if a significant effect had been detected, given its magnitude it could not easily account for the moderate effect that the assessment situation had on implicitly assessed attitudes in Experiment 1 ($d = 0.40$). Based on these considerations, we conclude that the tendency for participants in Experiment 1 to show less bias on the IAT in the public versus the private condition probably did not arise because of a conscious attempt on their part to provide socially desirable responses.³

GENERAL DISCUSSION

In this research we examined whether an assessment situation influenced participants' implicitly assessed attitudes, and whether such an effect occurred because of socially desirable responding. In Experiment 1, participants completed an IAT measuring attitudes toward homosexuality in either a public assessment situation in which they believed that the experimenter would know their level of bias, or in a private assessment situation in which participants believed that the experimenter would not know their level of bias. Results indicated that participants in the public assessment situation exhibited significantly less bias toward homosexuality on the IAT than did those in the private assessment situation. To determine whether socially desirable responding could account for this effect, we performed a second experiment that utilized a bogus pipeline manipulation. Specifically, participants completed the IAT in a public assessment situation believing that the experimenter either did or did not have a pipeline into their true level of bias. In contrast to a social desirability explanation, however, results indicated that participants' implicitly assessed attitudes were not significantly different in the bogus pipeline and no-bogus pipeline conditions.

Malleability and Automaticity

Participants in this research exhibited lower levels of bias on an implicit measure when they completed it in a public versus a private assessment situation. This finding is consistent with an emerging

³ It is worthwhile to note that even though participants in Experiment 2 completed the IAT in a public assessment situation, their mean IAT effect was higher than the mean IAT effect of participants in the public condition of Experiment 1 who also completed the IAT in a public assessment situation. This difference may reflect the fact that participants in Experiment 2 completed the IAT in the presence of physiological equipment whereas participants in Experiment 1 did not. Because the physiological equipment used in Experiment 2 was present in both the bogus and no-bogus pipeline conditions, any influence that it might have had on participants' IAT effects would have been held constant across conditions. Accordingly, the possibility that the presence of the physiological equipment elevated participants' IAT effects does not vitiate our conclusion that the tendency for participants in Experiment 1 to show less bias on the IAT in the public versus the private condition probably did not reflect socially desirable responding. The observed difference is, however, consistent with the main finding of our research, i.e., that situational factors can influence implicitly assessed attitudes outside of people's awareness.

literature showing that implicitly assessed attitudes change in response to a variety of factors, including the social situation in which implicit measures are completed (Lowery, Hardin, & Sinclair, 2001; Richeson & Ambady, 2003; Sechrist & Stangor, 2001; for a review, see Blair, 2002). The finding that people's implicitly assessed attitudes toward a stigmatized group change in response to the assessment situation is theoretically important for at least two reasons. First, it indicates that implicitly assessed attitudes may be susceptible to some of the same factors that influence explicitly measured attitudes. For example, our finding that a public assessment situation lowered bias on an implicit measure relative to a private assessment situation mirrors the pattern found with explicit measures of bias which also elicited lower levels of bias when completed in public than in private (Blanchard et al., 1994; Plant & Devine, 1998). Second, it reinforces the contention that implicit measures do not necessarily provide a window into people's true attitudes (Nosek et al., in press). For example, when used to assess bias, implicit measures may indicate a higher or lower level of bias than individuals actually hold depending on whether they take the measure in a public or a private situation.

Individuals' tendency to show less bias on an implicit measure in a public versus a private assessment situation also has important practical implications for members of stigmatized groups. It suggests that subtle forms of bias, which are often difficult to control (Greenwald & Banaji, 1995), can be lowered by making people's responses and behaviors accessible to others. Reducing subtle forms of bias toward stigmatized groups in public is vital because doing so increases the likelihood that positive social interactions will occur (Dovidio, Kawakami, & Gaertner, 2002) which, in turn, could promote better intergroup relations in the long run. However, in many real-world contexts, the subtle forms of bias that people exhibit toward stigmatized individuals occur in private, e.g., performance evaluations and promotion decisions. Our findings suggest that in such cases bias may occur privately despite an absence of publicly expressed bias. Thus, organizations and institutions committed to reducing various forms of prejudice toward stigmatized groups may be most successful if they hold people publicly accountable for their decisions.

The finding that responses to an implicit measure of bias were altered by the assessment situation also raises an important question: What process produced that effect? In the current research, we considered whether socially desirable responding might have been responsible for the influence of the assessment situation on implicitly assessed bias toward homosexuality but did not find any evidence that such a process was operating. Participants' responses to an IAT were similar regardless of whether they believed that the experimenter had a pipeline into their true attitudes or not. This finding is important because it suggests that while the assessment situation has the same effect on both explicitly and implicitly assessed attitudes, the underlying process responsible for this effect differs. Whereas past research has demonstrated that socially desirable responding is responsible for the effect that the assessment situation has on explicitly measured bias (Plant & Devine, 1998), our research indicates that conscious efforts at socially desirable responding is an unlikely explanation for the effect of the assessment situation on implicitly assessed attitudes.

The lack of support that we found for the hypothesis that socially desirable responding influences implicitly assessed attitudes is consistent with Blair's (2002) model of automatic activation of associated constructs. According to Blair (2002), the malleability of implicitly assessed attitudes reflects changes in automatic processing, thereby suggesting that the effect that the assessment situation had on participants' implicitly assessed attitudes toward homosexuality in Experiment 1 occurred outside of their awareness. For example, perhaps participants in the public assessment situation condition focused on the IAT to a greater extent than did participants in the private assessment situation condition. These differences in attention to the measure could have conceivably influenced participants' responses outside of their awareness. Thus, while it is clear that the assessment situation in which people complete an implicit measure can shift their responses up or down, such shifts do not appear to reflect conscious attempts on the part of participants to fake or misrepresent

their attitudes. In this respect, the IAT at least partially fulfills the promise that it is relatively impervious to social desirability concerns (Greenwald et al., 1998) despite the fact that IAT responses are malleable.

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