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Implicit bias and motivation to respond without prejudice

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Implicit bias and motivation to respond without prejudice

by

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A thesis submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of
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ABSTRACT

Past research on motivation to be non-prejudiced has found that individuals who are primarily motivated by fear of others' reactions to their bias reduce their bias on publicly administered explicit measures but are unable to do so on separately administered implicit measures. However, those results are confounded because the measures of implicit bias were not administered publicly where externally motivated individuals would most likely reduce their bias. The present study examined the influence of motivation to respond without prejudice on implicit bias by eliminating that confound. Implicit bias was measured with the Implicit Association Test (IAT), which was administered privately and publicly with other explicit measures. Results illustrate that both implicit and explicit bias are significantly reduced in a public setting and that the reduction unrelated motivation type.

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INTRODUCTION

Social pressures have made the explicit avowal of prejudice an increasingly uncommon event in our society. However, prejudicial behavior remains. One explanation for the contradiction is that reduction in the explicit expression of prejudice has largely not affected the implicit biases people hold (Dovidio, Gaertner, Kawakami, & Hoson, 2002). Researchers have suggested that individuals can consciously deny possessing biased attitudes while still engaging in an implicit form of bias, presumably out of their conscious control (Greenwald & Banaji, 1995). Thus, one's conscious motivation to appear non-prejudiced has been assumed to affect explicit expression of biased attitudes, but to have little effect on underlying implicit biased attitudes (Fazio, Jackson, Dunton, & Williams, 1995). This proposition, however, has not been fully tested in the literature. Although past researchers have indeed found support for the idea that motivation is unable to attenuate the effects of implicit attitudes, their efforts were confounded because individuals were not given an opportunity to censure their implicit attitudes. Implicit attitudes have been assessed without the participants' knowledge, effectively eliminating the effect of any motivation they possessed to be non-prejudiced. In the current study, this confound was eliminated by allowing some participants to be fully aware of the assessment of their implicit attitudes in order to determine if this knowledge reduces their implicit responses compared to individuals who are not aware of the assessment of their implicit attitudes.

Examining implicit attitudes has become an important part of looking at individuals' prejudicial beliefs. Greenwald, McGhee, and Schwartz (1998) illustrated this by showing that although typical White people will explicitly assent to positive or neutral attitudes towards African Americans, they will also show implicitly biased attitudes towards African

Americans at the same time. Furthermore, even individuals who are strongly motivated to avoid bias, and thus explicitly deny biased attitudes, often still show biased implicit attitudes (Devine, Plant, Amodio-Jones, & Vance, 2002; Lemm, 2001).

The relationship is more complex than this, however. Because there are different types of motivation to avoid bias, not every person who wants to avoid bias possesses inconsistencies between implicit and explicit attitudes. Devine et al. (2002) found that robust implicit/explicit inconsistencies generally occurred for individuals who have an external motivation to be non-prejudiced but not as much for those who have an internal motivation to be non-prejudiced. Externally motivated individuals try to lessen their prejudicial attitudes in order to avoid public censure while internally motivated individuals avoid prejudice because of their personal standards (Plant & Devine, 1998). When an explicit racism measure is given in a public format, externally motivated individuals are more likely to censor their explicit attitudes, although at the same time they still show implicit bias. Those individuals who have an internal desire to be non-prejudiced, however, show similar low amounts of explicit and implicit bias (Devine et al., 2002; Lemm, 2001). Seemingly, because externally motivated individuals adjust their attitudes to conform to social pressure, the result is inconsistency between controllable explicit attitudes and uncontrollable implicit attitudes while internally motivated individuals actually report their true attitudes leading to internal/external consistency.

Yet, the contention that externally motivated individuals are adjusting their explicit attitudes while their implicit attitudes remain unaffected is not clearly demonstrated. In these previous studies the method of administering the implicit measures has not allowed for externally motivated individuals to actually censor their implicit attitudes. Participants who

are high in external motivation to respond without prejudice have not been given measures of implicit bias in social situations where they feel they must control their responses. In the studies that have combined measurements of implicit/explicit prejudice and internal/external motivations to respond without prejudice, the implicit measure was administered in a private setting without explanation of the purpose of the implicit test (Devine et al., 2002; Lemm, 2001). In fact, some participants have even been intentionally misled to believe that the implicit measure was actually part of a memory experiment (Devine et al., 2002). With the implicit measure remaining covert the motivation to conceal one's prejudice may have been reduced, explaining why externally motivated individuals showed bias on implicit measures. Thus, the researchers effectively eliminated social motivation from having an influence. Because there is no social aspect in a private situation, their motivation to appear non-prejudiced is removed and they report significantly more bias than in a public situation (Plant & Devine, 1998). Unlike with an explicit prejudice measure, unwitting participants taking an implicit measure would have no suspicion that their prejudicial attitudes are even being measured, so, just as when they are in private, they would have no reason to attempt to control their responses. Therefore, the assumption that externally motivated individuals are trying to hide their prejudices but failing is not necessarily true. Externally motivated individuals may indeed have difficulty controlling their implicit bias, but past research using implicit measures cannot claim that external motivation has no effect on them because the measures were not administered publicly.

A growing line of evidence gives support to the notion that the testing situation should be able to influence externally motivated individuals' implicit attitudes. The notion that implicit attitudes are unalterable is slowly fading in a flood of new evidence. One such

piece of evidence is that explicit and implicit measures are moderately correlated (Banse, Seise, & Zerbis, 2001; Cunningham, Preacher, & Banaji, 2001; Lemm, 2001; Neuman & Seibt, 2001). In addition, Blair (2002) reviewed the literature surrounding implicit bias and found that just as explicit attitudes can be influenced by situational and personal factors, implicit attitudes are also influenced by many similar factors (i.e., stimulus cues, attention, and strategies used to avoid bias). For example, factors such as the race of experimenters and the need to maintain self-esteem have been found to alter implicit attitudes once thought of as fixed. Therefore, in light of the evidence, there is a need to directly test if the testing situation moderates externally motivated individuals' implicit attitudes.

In the current study, the previous confound involving social motivation was eliminated by having participants give their explicit and implicit attitude responses during either a private or public administration. Private groups were not told the nature of the implicit measure and completed it confidentially. Public groups were told the purpose of the implicit measure and were asked to share their results on the test. These variations in procedure were expected to completely eliminate the previous confound by placing the implicit measure into a public realm where motivation to respond without prejudice can have an effect.

When implicit bias is measured in a truly public situation, we expected a partial replication of past research for externally motivated individuals. Specifically, externally motivated individuals were expected to show significantly lower bias on explicit measures in public situations than in private situations. However, inconsistent with past research we expected that externally motivated individuals would also be significantly lower in public and private assessments of implicit bias. Therefore, externally motivated individuals' biases

in public situations were expected to be significantly lower than biases in private situations on both explicit and implicit measures.

To summarize the specific hypotheses used in the current study:

1. Externally motivated individuals were expected to show significantly less bias in public administrations of explicit measures of bias.
2. Externally motivated individuals were expected to show significantly less bias in public administrations of implicit measures of bias.

Confirmation of the hypothesis has several implications for both the implicit attitude and motivation to respond without prejudice literature. First, for the implicit attitude literature it would suggest that the implicit measures are much more influenced by individual differences in desire to appear non-prejudiced than was previously assumed. Second, for the motivation to respond without prejudice literature it suggests that the constructs of internal versus external motivation are much more pervasive and influential than previously imagined. Although their influence on easy to control explicit measures has been demonstrated, the current study would show internal and external motivation has even more influence over implicit attitudes than was previously thought. Both implications would be significant additions to the literature.

LITERATURE REVIEW

The literature review is divided into five sections. The first section defines implicit attitudes. The second section delineates the construction, scoring, validation, and applications of the most popular measure of implicit attitudes that has been selected for use in the present study: the implicit association test (IAT). The third section focuses on factors that have been found to influence implicit measures such as the IAT. The fourth section explains motivation to respond without prejudice and why it is an important influence on implicit attitudes. Finally, the last section explains why gay men have been selected as the targets for bias in the present study.

Implicit Attitudes

Greenwald and Banaji (1995) reviewed the research that has been done on implicit social cognition and the authors came to a definition of implicit cognition as “An implicit C is the introspectively unidentified (or inaccurately identified) trace of past experience that mediates R (p. 5)” where C is a construct such as attitudes and R is a response. Using this definition the authors are able to identify strong lines of research examining the internal processes of which humans are unaware but that have profound effects on attitudes, self-esteem, and stereotypes (Greenwald & Banaji, 1995). The authors cite halo effects and preference for people similar to ourselves as two well-known effects of implicit social cognition. They also state that lesser known priming effects are also important forms of implicit social cognition (Greenwald & Banaji, 1995). In some priming studies, negative words are flashed on a computer screen and facilitate quicker recognition of words with other negative connotations that follow them. For example, the word Bad would facilitate quicker recognition of the word Gay among individuals who had a bad connotation for the word Gay

than if the word Good was flashed first. It is these types of implicit social cognitions that are most important to the present study.

The Implicit Association Test

Greenwald and Banaji's (1995) review of implicit social cognition ended with a call by the authors for a measure of individual differences in implicit social cognition and a prediction that the invention of such a measure would spur on a new field of research. The challenge foreshadowed Greenwald's development of the Implicit Association Test (IAT) (Greenwald, et al., 1998). The following sections will attempt to summarize the IAT literature by delineating the IAT's construction, validation process, possible confounds, and applications.

Test Construction

The IAT was originally used for and has been most commonly used to measure bias towards African Americans so the example given here follows that paradigm. The IAT consists of five trials. Participants respond to stimuli by pressing computer keys with either their left or right hand corresponding with the category that has been designated as left or right. In the first two trials the concepts Black-White and pleasant-unpleasant are discriminated by the participant. In the third trial those categories are combined so that White and pleasant are responded to with one hand and Black and unpleasant are responded to with the other. For example, White names and pleasant words are identified with the left hand and Black names and unpleasant words are identified with the right hand. The fourth trial then switches the concept identified on the left and right sides. Finally, in the fifth trial the combination of concepts switch so that Black and pleasant are combined and White and unpleasant are combined. The logic behind the IAT is that White and pleasant are easily

combined cognitively and therefore quickly responded to while Black and pleasant are difficult to combine and therefore participants typically respond more slowly. The difference in the time it takes to complete the combining tasks is called the IAT effect and is considered to be a measure of implicit attitudes about the two groups.

Initial Validation

Greenwald et al. (1998) provided three studies in their initial validation of the test that show the consistent ability of the IAT to identify implicit attitudes. The first study simply illustrated the IAT's ability to differentiate between concepts with obvious positive and negative connotations so as to validate the IAT effect. Results showed an IAT effect with implicit bias for flower names versus insect names and musical instruments versus weapons. The second study then took a sample of Korean and Japanese students and used Japanese and Korean names as the categories to be differentiated. Citing the past cultural difficulties between the Japanese and Korean people as the reason for bias, Japanese individuals were slower when associating Korean names with positive words than in associating Japanese names with positive words and Korean individuals were slower when associating Japanese names with positive words than when associating Korean names with positive words. Study two further validated the IAT by discovering that the amount individuals were imbued in their respective cultures moderated their IAT effect. So, the results showed how more Americanized Koreans and Japanese participants, with ostensibly reduced cultural bias, had significantly smaller IAT effect, and subsequently less implicit bias towards the other group. Finally, the third study looked at Whites' bias towards Blacks. The purpose of the final study was to determine if individuals who rejected overt bias against Blacks would still show an

IAT effect. Indeed, although only one person showed a pro-Black IAT effect, nearly all of the students explicitly assented to a neutral or positive attitude towards Blacks.

Amazingly, the IAT seems entirely robust to procedural variables. Only one order effect was found internally so that the critical trials must be counterbalanced to account for practice effects. Outside of that one qualification, the number of words, time between stimulus, and order of the IAT in the procedure has no effect (Greenwald & Nosek, 2001). Greenwald et al. (1998) successfully showed that a simple procedure using categorization tasks and reaction times was able to meet the challenge to develop an individual differences test of implicit social cognition (Greenwald & Banaji, 1995). Subsequently, the prediction that a whole new research field would emerge from such a measure seems to have come to fruition. However, not all researchers were immediately convinced.

Eliminating Possible Confounds

The emergence of the IAT was not without critics. The most common objection was the suspected confounding variable of stimuli familiarity. Obviously, the average White individual is going to be more familiar with names common in his or her own race, so to assume that translates into implicit racism is not logical. Some evidence for this contention was shown by producing an IAT effect using White names and nonsense words with no prior associations (Brendl et al., 2001). In addition, when unfamiliar stimuli are used, the IAT effect is reduced. However, the IAT effect does not completely disappear when unfamiliar stimuli is used, so the basic logic behind the IAT is in fact valid (Ottaway, Hayden, & Oakes, 2000). Furthermore, changes in the IAT methodology reduced the importance of familiarity. The use of pictures instead of names was a major advancement that all but eliminated the

familiarity confound because if none of the participants had ever seen the faces before, familiarity was automatically controlled (Dasgupta, McGhee, Greenwald, & Banaji, 2000).

Although the familiarity explanation was addressed, another interpretation of IAT effects is that individuals have positive attitudes about one concept and no attitude at all about the other concept (Brendl et al., 2001). So, a White person who is very positive about other Whites and has no negativity towards African Americans would still theoretically produce an IAT effect indicative of bias. However, the clear evidence that IAT scores are associated with explicit bias eliminates that confound and also provides convergent validity to IATs (Banse et al., 2001; Cunningham et al., 2001; Lemm, 2001). Other researchers have addressed this complaint by illustrating that the IAT effects may be produced whenever an in-group and out-group are established (Ashburn-Nardo, Voils, & Menteith, 2001). Thus, pre-standing positive attitudes about one concept are not necessary. Overall, the use of equally familiar stimuli and its association with explicit attitudes have led to the elimination of the most dangerous possible confounds of IAT research.

Applications of the IAT

With the validity and reliability of the IAT established at acceptable levels, researchers began to apply it more diversely. The most common use of the IAT has been as a measure of implicit attitudes about an out-group. As mentioned previously, simply telling participants that they are similar to a fictional group they are unfamiliar with is enough to produce an IAT effect. However, the more useful application is to assess attitudes about social groups when they are overtly accepted, but unconscious prejudice may remain. For example, in Greenwald et al.'s (1998) original study, the majority of participants were neutral or pro-Black in their overt responses while only one was pro-Black in their implicit

responses. These results have subsequently been replicated (Ottoway et al., 2001). Other groups that have been examined and found to produce IAT effects include Whites towards Hispanics (Ottoway et al., 2001), Germans towards Turks (Neumann & Seibt, 2001), old and young people towards old people (Nosek, Banaji, & Greenwald, 2002), and most related to the present study, heterosexuals towards homosexuals (Banse, et al., 2001; Lemm, 2001; Steffens & Buchner, 2003). The Banse et al. (2001) study performed particularly well in establishing the IAT's validity with homosexuality because it sampled populations of both opposite sex oriented and same sex oriented individuals. As would be expected, the heterosexual participants were found to have IAT effects negative towards homosexuality and the same sex oriented individuals were found to have IAT effects positive towards homosexuality. These results show that the IAT effect has been established in many situations where bias would be expected, but most importantly for the present study, an IAT examining implicit attitudes towards homosexuality was found to perform in the expected directions with both heterosexual and same sex oriented individuals.

Factors Influencing Implicit Attitudes

Obviously, individual differences such as sexual orientation would be expected to have an influence on the results of an IAT but research has shown that other factors also influence implicit attitudes. The assumption about automatic bias is often that it is a rigid characteristic that is impenetrable to outside influence, but Blair (2002) reviewed the ways that implicit measures of prejudice and stereotypes have been shown to be malleable. Several factors were found to moderate the measurable effects of implicit attitudes. Motivation such as the need to preserve self-esteem, specific strategies such as thinking of counter-stereotypes, attention to stimuli during the test, and the characteristics of the stimuli that elicit

the automatic attitudes have all been found to have effects on implicit attitudes. Most of these moderating effects were demonstrated with measures other than the IAT; however, the IAT has also been shown to be sensitive to personal and environmental factors.

There is an increasing amount of evidence that the implicit attitudes assessed by the IAT are influenced by many variables. The literature seems to indicate in fact that implicit attitudes can be relearned to some extent. New associations can be formed by repeatedly pairing concepts that participants normally show bias towards and positive concepts. After repeated pairings, implicit bias is reduced (Dasgupta & Greenwald, 2001; Karpnski & Hilton, 2001) and the effects seem to be more that transient because they have been shown to remain 24 hours later (Dasgupta & Greenwald, 2001). In a more applied setting, Rudman, Ashmore, and Gary (2001) used the IAT in a pre-post assessment of an undergraduate multicultural education course. The researchers found that the multicultural course significantly reduced implicit bias among White students while students in a control course experienced no change. Most importantly to the current study, social motivation is another factor that has been found to influence IAT scores. When an African American experimenter is in charge of administering the IAT, scores are significantly lower (Lowery, Hardin, & Sinclair, 2001). In summary, although often conceived as automatic and stable, implicit attitudes as measured by the IAT are quite dynamic and the present research was designed to illustrate this further.

Motivation to Respond Without Prejudice

Not only do environmental factors have an effect on implicit attitudes, but personal factors such as motivation to respond without prejudice are also important (Devine, et al., 2002, Lemm, 2001). Although there have only been two major studies that have combined the two lines of research (Devine, et al., 2002, Lemm, 2001), motivation to respond without

prejudice remains the only quantifiable measure of personal differences that has been shown to influence implicit bias as measured by IATs. Plant and Devine (1998) created the Internal/External Motivation to Respond Without Prejudice Scale based on their observation that although explicit admission of prejudice has been reduced dramatically in recent years, individuals' motivation to be non-prejudiced may arise from fear of public censure over racist attitudes and not an internal acceptance of egalitarian views. Although traditional measures do not take this motivational factor into account, they designed the Internal and External Motivation to Respond Without Prejudice Scales in order to differentiate between individuals who avoid prejudice due to internal standards and those who avoid prejudice due to fear of other's reactions.

In their validation of the scales, Plant and Devine (1998) found that internal and external motivation have important relations to individuals' expressions of bias. For example, individuals with a primarily high internal motivation were found to possess less prejudice as a group than individuals with a primarily high external motivation. More interestingly, the amount of bias expressed was found to be a result of not only the type of motivation possessed but the situation in which the attitudes were assessed as well. When assessed in a private situation or a public situation, internally motivated people expressed the same views. However, socially motivated individuals expressed more prejudice in a private assessment than during a public assessment where there was opportunity for censure from others.

Motivation to respond without prejudice has an important relationship with implicit attitudes as well. To begin, individuals with a high external and low internal motivation have been found to have the most implicit bias and individuals with a low external and high internal motivation were found to have the least implicit bias (Devine et al., 2002). In

addition, Lemm (2001) explored how motivation to respond without prejudice influences the relation between explicit and implicit measures. Individuals with low external motivation were found to have a strong implicit-explicit relationship while individuals high in external motivation were found to have a weak implicit-explicit relationship. Research findings show that internal and external motivation are related to individuals' level of implicit bias as well as the relationship between their implicit and explicit bias. The relation makes internal and external motivation important factors to assess in studies involving implicit and explicit measures of bias. However, before further assumptions are made about the aforementioned relationships, the influence of external motivation on implicit attitudes must be examined in a public situation.

Target for Implicit and Explicit Bias

African Americans have largely been the focus of studies of implicit bias. However, following the lead of Banse et al. (2001) and Lemm (2001), individuals with same sex orientations are the targets of bias in the present research. Same sex oriented individuals represent an important group to examine because they are in the midst of their struggle for full acceptance in society, despite strong pressure from some groups against their integration. Public opinion of both homosexual acts and individuals who are homosexual in the United States is quite negative (Herek, 2000; Yang, 1997). A host of more specific correlates to negative attitudes have been found in past research. For example, lack of personal contact with lesbian, gay, and bisexual (LGB) individuals, being a male, conservative religious values, and authoritarianism have all been found to be related to bias towards homosexuality (Herek, 1996; 2000; Herek & Glunt, 1993). Despite the distaste for homosexuality and homosexual practices still prevalent in our society, explicit prejudice towards LGB

individuals has been reduced in recent years (Yang, 1997). Our society has also seen a reduction in the willingness to freely express biased attitudes towards homosexuality due to the strong forces of political correctness (Blanchard, Lilly, & Vaughn, 1991; Monteath, Deneen, & Tooman, 1996). Therefore, individuals may possess strongly conflicted implicit and explicit attitudes about homosexuality, which makes homosexuality an interesting target for the measurement of implicit and explicit bias.

Summary

Societal influences have made it difficult to assess individuals' true beliefs about minorities. Those who express negative views are largely looked down upon, making explicit admission of prejudice unlikely. Research on motivation to respond without prejudice also illustrates the difficulty in relying on individuals' self-reports of bias because of the influence of social pressure to appear non-prejudiced. Implicit measures are one answer to the problem because their purpose is to tap into the unconscious biases individuals may have. Assessing implicit attitudes seems to be a perfect solution to the problem because of the research trend that appears to illustrate the inability of individuals to hide their implicit bias. One way to measure these unconscious attitudes is the IAT, which is an instrument with growing validity in measuring attitudes that individuals cannot or do not want to admit. Despite the validity, there are some aspects of implicit attitudes and the factors that influence them that must be examined more closely. As previously discussed, personal and external factors are increasingly being seen as influences on implicit attitudes and there are untested assumptions about the potential of motivation to affect implicit attitudes. The present research on implicit attitudes towards the maligned social category of homosexuality takes the important step of

assessing implicit attitudes publicly in order to determine just how impervious they are to the effects of motivation to appear non-prejudiced.

METHODS

Participants

The study was conducted at a large Midwestern university. A total of 153 undergraduates participated in exchange for extra credit in psychology courses. They were recruited using the psychology department's undergraduate posting board where students seek out extra credit opportunities. Participants were 33% male and 65% female with 2% choosing not to designate a sex. Participants' average age was 19.6 years; participants identified themselves as 85% White, 8% Asian, 4% African American, 2% Hispanic, and 1% designated themselves as other. Only participants who designated themselves as heterosexual were included in the analysis which resulted in the exclusion of 5 individuals. In addition, technical failure resulted in 3 participants not completing the IAT portion of the procedure, so they were also excluded from all analyses.

Measures

Explicit Measures

Homophobia. Homophobia was measured using the Index of Homophobia (IHP) (Hudson & Ricketts, 1980). See Appendix A for directions and items. The IHP is a 25-item scale that measures homophobia by defining it as irrational fear of being in close quarters with LGB individuals. The measure contains items such as "I would feel comfortable working closely with a male homosexual" and "I would enjoy attending a social function at which homosexuals were present." Statements were rated on a 5-point scale from 1 (*strongly agree*) to 5 (*strongly disagree*). The authors' interpretation of scores is that 0-25 represents "high grade non-homophobics", 25-50 "low grade non-homophobics", 50-75 "low grade homophobics", and 75-100 "high grade homophobics." The authors report an acceptable

internal consistency of .90. Because the IHP was constructed as a unidimensional scale, the coefficient alpha score of .90 is also cited as evidence of the IHP's factor validity. The authors also point to convergent validity in the form of the IHP's significant correlation of .53 with a measure of conservative sexual attitudes. Subsequent researchers have also demonstrated the validity of the IHP. Differences in nurses' attitudes towards homosexual AIDS versus heterosexual AIDS patients is related to IHP scores (Young, Henderson, & Marx, 1990). In counselor samples, IHP scores have been shown to predict the number of social relationships with gays and lesbians (Barrett & McWhirter, 2002). Counselors who have high IHP scores are also more likely to refer gay male clients out and be uncomfortable working with them (Crawford, Humfleet, Ribordy, Ho, & Vickers, 1991). The IHP showed excellent internal consistency in the current sample with an alpha score of .90 and its convergent validity was illustrated with its significant correlation of .82 with the Heterosexism Scale.

Heterosexism. Heterosexism was measured using Park and Biescke's (2002) Heterosexism Scale (HS). See Appendix B for directions and items. Individuals high in heterosexism would tend to have attitudes rejecting homosexuality and affirming heterosexuality while a low score on the HS is indicative of affirming attitudes about both homosexuality and heterosexuality. Typical questions on the scale include items such as, "All sexual orientations are natural expressions of human sexuality" and "Only heterosexual individuals are appropriate religious leaders." Statements were rated on a 6-point scale from 1 (*Strongly agree*) to 6 (*Strongly disagree*). Preliminary evidence provided by the authors suggests excellent internal consistency illustrated by an alpha score of .96 (Park & Biescke, 2002). The authors also conducted a confirmatory factor analysis that supported the

theoretical 2-factor solution. One factor is related to the superiority of heterosexuality and the other is related to tolerance of homosexuality. Discriminant validity for the scale is seen in its weak correlation to a social desirability measure. Preliminary research has found the HS scale to have a large, significant correlation to IHP pointing to its convergent validity. In addition, among counselors in training, a relationship exists between high scores on the HS and stereotypic beliefs about the mental health of gay men (Boysen, Vogel, Madon, & Wester, 2002). The HS showed excellent internal consistency in the current sample with an alpha score of .90 and its convergent validity was illustrated with its significant correlation of .82 ($p < .05$) with the Index of Homophobia.

Motivation to Respond Without Prejudice. Internal and external motivation to respond without prejudice was measured with the External Motivation to Respond Without Prejudice Scale (EMS) and the Internal Motivation to Respond Without Prejudice Scale (IMS) (Plant & Devine, 1998). See Appendix C for the directions and items. Consistent with the procedure of Lemm (2001), the scale was modified from its original form to assess prejudice towards gays, lesbians, and bisexuals instead of Blacks. Each scale is 5 items long and they are presented simultaneously to participants. The EMS measures external motivation to act non-prejudiced with items such as “Because of today’s PC (politically correct) standards I try to appear non-prejudiced towards gays, lesbians, and bisexuals” and the IMS measures personal motivations to act non-prejudiced with items such as “I attempt to act in non-prejudiced ways towards gays, lesbians, and bisexuals because it is personally important to me.” Participants were asked to respond according to a 9-point scale from 1 (*strongly agree*) to 9 (*strongly disagree*). Reliability of the scales is more than adequate for research purposes. In three samples, the IMS and EMS were found to have an internal consistency from .76 to .85 and

the test-retest reliability was .77 for the IMS and .60 for the EMS across 9 weeks (Plant & Devine, 1998). Plant and Devine (1998) illustrated the validity of the scales in several ways. High scores on the IMS are related to low levels of prejudice and high scores on the EMS were related to higher levels of prejudice. The EMS was also shown to measure a construct independent of social desirability. In the current study the IMS and EMS showed good internal consistency with alpha scores of .88 and .83 respectively. In addition, correlations supported the convergent and divergent validity of the two scales in the present study. The two measures were unrelated ($r = .02, p < .05$), and the IMS was significantly related to the IHP and the HS ($r = -.62, p < .05$; $r = -.69, p < .05$).

Demographic survey. Participants also completed a demographic survey. The survey assessed demographic information and variables that are related to attitudes about homosexuality. The demographics of ethnicity, age, sex, year in school, and psychology education were assessed. Also addressed was sexual orientation and number of relationships with LGB individuals. Past research has shown the importance of these variables in relation to attitudes about homosexuality (Herek, 1996; 2000; Herek & Glunt, 1993).

Implicit Measures

Implicit Association Test. The implicit measure of bias for the present study is the Implicit Association Test (Greenwald et al., 1998). Implicit Association Tests measure the relative strength of associations between two concepts. If two concepts are associated, performing a sorting task is easy, and therefore can be completed quickly. If two concepts are not associated, performing a sorting task is difficult and takes more time. The IAT stimulus material consisted of 5 photos of lesbian couples, 5 photos of gay male couples, 10 photos of heterosexual couples, 10 pleasant words and 10 unpleasant words. Photos were taken from

Internet sites posting pictures of romantically involved couples. Pictures that were most illustrative of the nature of the romantic relationship through proximity and embraces were selected. Same sex couples represent the concept Gay and opposite sex couples represent the concept Straight. Ten words with good connotations such as “friend” are used for the concept Good and 10 words with bad connotations such as “tragic” are used for the concept Bad. Words were taken from the norms reported by Bellezza, Greenwald, and Banaji (1986) that were used in the initial validation of the IAT (Greenwald et al., 1998).

Procedure

Public Administration

The explicit measures were administered in paper form and the IATs were administered using desktop computers. E-Prime computer program was used to present and record each participant’s responses and reaction times. The explicit measures were always presented second because their transparent wording would have allowed participants to guess the purpose of the IAT.

All of the IAT tasks are presented over 5 blocks with 40 or 80 trials. The 2 critical blocks used for data analysis consist of 80 trials and the non-critical blocks of 40. Trial 1 consists of categorizing Gay and Straight, and trial 2 Good and Bad. Trial 3 is counterbalanced with trial 5 so that half the participants will categorize either Good-Straight and Bad-Gay or Good-Gay and Bad-Straight first. The fourth trial reverses the Good-Bad response side depending on which concept combination is presented first.

At the beginning of each IAT a screen informs the participants that same sex couples are gay and opposite sex couples are straight. Before the start of each set of trials, the instructions are presented on which concepts are associated with which response key. The

concepts remain on the left and right sides of the screen for the duration of the trials as a reminder while the stimuli flashed in the center of the screen.

Participants knew they were participating in a study entitled Reaction Times and Social Groups and that they would be presented with images of individuals in different social groups. Upon arrival participants were greeted and asked to sign an informed consent. After signing the informed consent the following statement was read.

You are about to take a measure of prejudice towards homosexuality on a computer. When you finish the test the computer will calculate your score and give you feedback about the level of bias you have towards homosexuality on a scale from 0, meaning low bias, and 100, meaning the most bias possible.

After I record your computer score, your bias will also be evaluated using some surveys. Please inform me when you are finished with the computer test.

Once participants finished the IAT, they worked on a filler task in a separate room as the experimenter looked at their IAT scores on the computer. When the participants were finished with the filler task, they were given the IHP and HS and told that, "I will now ask you some questions that evaluate your bias towards homosexuality. Please follow along with me as I read the questions and tell me how you would score each item." The IHP and HS were then read to the participant with the experimenter recording their answers. After the explicit measures of bias were administered, participants filled out the IMS/EMS scale. Before they completed the IMS/EMS scale and demographic survey, the following statement was read.

Although your level of bias is going to be computed eventually, I have not been evaluating your level of bias during this experiment. You will now take

one more survey that is completely confidential and please remember that I will not be evaluating in any way.

Upon completion of the final surveys the participants were debriefed and released.

Private Administration

After reading and signing an informed consent form participants were informed that all their responses were completely confidential. The IAT was given with no introduction other than the directions needed to complete the measure. After completion of the implicit measure, the explicit surveys were administered confidentially and participants were debriefed.

Data Reduction

The reaction time data was measured in milliseconds (ms). Consistent with Greenwald, Nosek, and Banaji's (2002) procedure, correct responses to stimuli were reduced by deleting all response times below 400 ms. Responses under 400 ms represent key strokes occurring before the participants could have processed the information presented on the screen. Incorrect responses were then recoded with a time punishment. The mean ms response rate for correct responses plus 600 ms replaced errors. The average response latency was then computed for the consistent and inconsistent blocks. In order to correct for the skew of reaction time data, the average response latencies for the consistent and inconsistent blocks were then divided by the standard deviation of the mean of correct latencies so that the data is consistent with the assumptions of parametric statistical tests.

Design

The research hypotheses were examined using hierarchical regression. The factors entered were the type of administration (group), IMS scores, EMS scores, and all two and

three-way interactions. From previous literature (Plant & Devine, 1998) we know that externally motivated individuals who reduce the amount of bias they show in a public situation tend to score low on the IMS and high on the EMS. Thus, a three-way interaction was expected between group, IMS, and EMS such that individuals low on IMS and high on EMS would have lower implicit and explicit bias in the public group than in private group. No other groups were expected to have reduced bias.

RESULTS

Preliminary Analyses

Validation of the Implicit Bias Measure

As only two published studies have examined implicit attitudes towards homosexuality with the IAT (Banse et al., 2001; Steffens & Bucher, 2003), we wanted to validate our use of the IAT, before examining our hypotheses, by seeing if our IAT results replicate the previous research findings. In particular, we expected implicit bias to exist towards homosexuality and a small but significant relationship between implicit and explicit bias towards homosexuality (Banse et al., 2001; Steffens & Bucher, 2003). The IAT effect is calculated first by comparing the reaction times of the two critical trials. To compute the IAT effect, the transformed ms response speed of the Gay-Good and Straight-Bad trial was subtracted from the Gay-Bad and Straight-Good trial. IAT effect scores that are positive are indicative of bias against homosexuality; negative IAT effect scores are indicative of positive bias towards homosexuality; and scores of 0 illustrate no bias. In order to illustrate the statistical significance of the IAT effect, the critical trials were subjected to a repeated measures t-test. As expected, the incongruent trial (Gay-Good and Straight-Bad) was significantly slower than the congruent trial (Gay-Bad and Straight-Good), $t(153) = 3.12, p < .002$, suggesting that bias towards homosexuality was present. In addition, a small but significant relationship was observed between IAT scores and an explicit measure of homophobia (IHP), $r = .22, p < .01$, but a significant relationship was not seen between implicit bias and heterosexism (HS), $r = .15, p > .05$. Current thinking about the IAT states that implicit bias should be more related to blatant explicit bias than subtle explicit bias (Gawronski, 2002). So, the current results are consistent with expectations because the IAT

was significantly correlated with the more obvious measure of homophobia (IHP) and not significantly correlated with the subtle measure of heterosexism (HS) (Gawronski, 2002). The results are also consistent with research that has illustrated implicit bias towards homosexuality (Banse et al., 2001; Lemm, 2001; Steffens & Bucher, 2003).

Bias and Contact with LGB Individuals

Past research has indicated that having personal interaction with LGB individuals can impact one's attitudes towards homosexuality (Herek & Glum, 1993). While this research has only focused on explicit attitudes, we thought it would be useful to examine if this was an important factor in understanding both explicit and implicit attitudes. To examine these relationships, participants' self-reported number of LGB friends and relatives was correlated with their explicit and implicit bias scores. Consistent with previous research, self-reported number of LGB relationships did correlate significantly with explicit bias IHP scores, $r = -.37, p < .01$, and HS scores, $r = -.30, p < .01$. In contrast, the self-reported number of LGB relationships did not correlate with implicit bias, $r = -.061, p > .05$. This difference in the relationship between personal interactions with LGB individuals and explicit and implicit bias can probably be best explained through the small correlation between explicit and implicit attitudes (Greenwald et al., 2002) and the unreliability of the single item measure of contact with LGB individuals. The moderate correlations to explicit measures does support the previous research that points to a relationship between contact with LGB individuals and positive self-reported attitudes towards homosexuality.

Bias and Sex

Past research has also found that participants' sex is related to attitudes about homosexuality, with men generally expressing less positive attitudes than women on self-

report measures (Herek, 1996; 2000). While the relationship between sex and attitudes towards homosexuality has been clearly shown on explicit measures, implicit measures have shown inconsistent results. Of the two studies that have looked at sex differences in implicit bias towards homosexuality, one found that men had more bias (Banse, et al., 2001) and the other reported that men and women were similar (Lemm, 2001). In the current study we found that men and women did not differ in their implicit bias towards homosexuality, $t(151) = -.58, p > .05$, but that females did express significantly less bias than men on the IHP, $t(151) = 4.23, p < .001$, and the HS, $t(151) = 3.49, p < .001$. (See Table 1 for means and standard deviations). These results support previous research on sex differences in explicit attitudes about homosexuality and give further to support to the similarity of men and women's implicit attitudes about homosexuality.

Table 1

Sex Differences in Implicit and Explicit Bias

	IAT		IHP		HS	
	Men	Women	Men	Women	Men	Women
<i>M</i>	.33	.42	80.45	70.24**	53.94	45.35**
<i>SD</i>	.84	.94	13.81	14.43	14.83	13.25

** $p < .01$

Note. IAT = Implicit Association Test, IHP = Index of Homophobia, HS = Heterosexism Scale.

Primary Analysis

Correlations between the IMS, EMS, IHP, HS, and IAT were computed. The correlations were run for the combined public and private groups, private group, and public group. Matrices for all three groups can be seen in Tables 2, 3, and 4.

Table 2

Correlation matrix for combined public and private administrations.

Variables	1	2	3	4	5
1. IAT		.22**	.15	-.09	-.12
2. IHP			.82*	-.62*	.09
3. HS				-.69*	.02
4. IMS					.03
5. EMS					

** $p < .01$

Note. IAT = Implicit Association Test. IHP = Index of Homophobia. HS = Heterosexism scale. IMS = Internal Motivation to Respond Without Prejudice Scale. EMS = External Motivation to Respond Without Prejudice Scale.

Table 3

Correlation matrix for private administration.

Variables	1	2	3	4	5
1. IAT		.25*	.18	-.04	-.13
2. IHP			.83**	-.62**	-.05
3. HS				-.72**	.02
4. IMS					.10
5. EMS					

** $p < .01$

* $p < .05$

Note. IAT = Implicit Association Test. IHP = Index of Homophobia. HS = Heterosexism scale. IMS = Internal Motivation to Respond Without Prejudice Scale. EMS = External Motivation to Respond Without Prejudice Scale.

Table 4

Correlation matrix for public administration.

Variables	1	2	3	4	5
1. IAT		.17	.06	-.14	-.48
2. IHP			.81**	-.64**	.28*
3. HS				-.69**	.07
4. IMS					-.07
5. EMS					

** $p < .01$

* $p < .05$

Note. IAT = Implicit Association Test. IHP = Index of Homophobia. HS = Heterosexism scale. IMS = Internal Motivation to Respond Without Prejudice Scale. EMS = External Motivation to Respond Without Prejudice Scale.

Relationship Between Motivation and Explicit Bias

The primary analysis of explicit bias was run using a 3-step hierarchical regression predicting scores on the IHP and HS separately. In the first step the factors entered were Group (public vs. private), IMS, and EMS. The second step entered the two-way interactions and the third step entered the three-way interaction.

Homophobia. The overall regression for IHP scores was significant, $F(7, 145) = 15.58, p < .001$, explaining a large amount of variance, $r = .66, r^2 = .43, adjusted\ r^2 = .40$. There was a trend of group predicting IHP scores, but significance was not at the .05 level,

$\beta = -3.48; t = -1.84; p < .068$. Despite the lacks of significance, as expected, HS scores in the public condition were lower than in the private condition (public: $M = 75.06, SD = 15.99$; private: $M = 71.70, SD = 14.10$). In addition, IMS significantly predicted IHP scores, $\beta = -6.0; t = -9.98; p < .001$. Consistent with past research showing that high scores on the IMS are associated with lower bias (Amodio, Harmon-Jones, Devine, 2003; Plant and Devine, 1998; Devine et al., 2002), high IMS scores were associated with lower bias on the IHP. All other factors, two-way interactions, and three-ways interactions were non-significant (all $ps > .05$).

Heterosexism. The overall regression for HS scores was significant, $F(7, 145) = 22.04, p < .001$, explaining a large amount of variance, $r = .72, r^2 = .52, adjusted\ r^2 = .49$. Group significantly predicted HS scores, $\beta = -5.17; t = -3.15; p < .002$. As expected, HS scores in the public condition were lower than in the private condition (public: $M = 45.57, SD = 12.88$; private: $M = 50.53, SD = 15.41$). In addition, IMS significantly predicted HS scores, $\beta = -6.31; t = -12.15; p < .001$. Consistent with past research showing that high scores on the IMS are associated with lower bias (Amodio, et al., 2003; Plant and Devine, 1998; Devine et al., 2002), high IMS scores were associated with lower bias on the HS. No other factors or interactions were significant (all $ps > .05$).

Relationship Between Motivation and Implicit Bias

The primary analysis of explicit bias was run using a 3-step hierarchical regression predicting scores on the IAT. In the first step the factors entered were Group (public vs. private), IMS, and EMS. The second step entered the two-way interactions and the third step entered the three-way interaction. Results showed that the overall regression for IAT scores was significant, $F(7, 145) = 2.4, p < .024$, and explained a small amount of variance, $r = .32$,

$r^2 = .10$, *adjusted* $r^2 = .06$. Group significantly predicted IAT scores, $\beta = -.37$; $t = -2.56$; $p < .012$. As was hypothesized, IAT scores in the public condition were lower than in the private condition (public: $M = 56$, $SD = .84$; private: $M = .20$, $SD = .93$). There also was a significant two-way interaction between IMS and EMS, $\beta = .05$; $t = -2.08$; $p < .039$. In order to examine the interaction predicted values were computed using the unstandardized β s, IMS and EMS means and standard deviations (IMS: $M = 6.64$, $SD = 1.59$; EMS: $M = 4.63$, $SD = 1.53$). See Table 5 for beta weights. The predicted values illustrated that for high IMS participants, those who also score high on the EMS are likely to have higher implicit bias than those who score low on the EMS (see Figure 1). All other factors, two-way interactions, and the three-way interaction were non-significant (all $ps > .05$).

Table 5

Coefficient Table for the IAT Regression

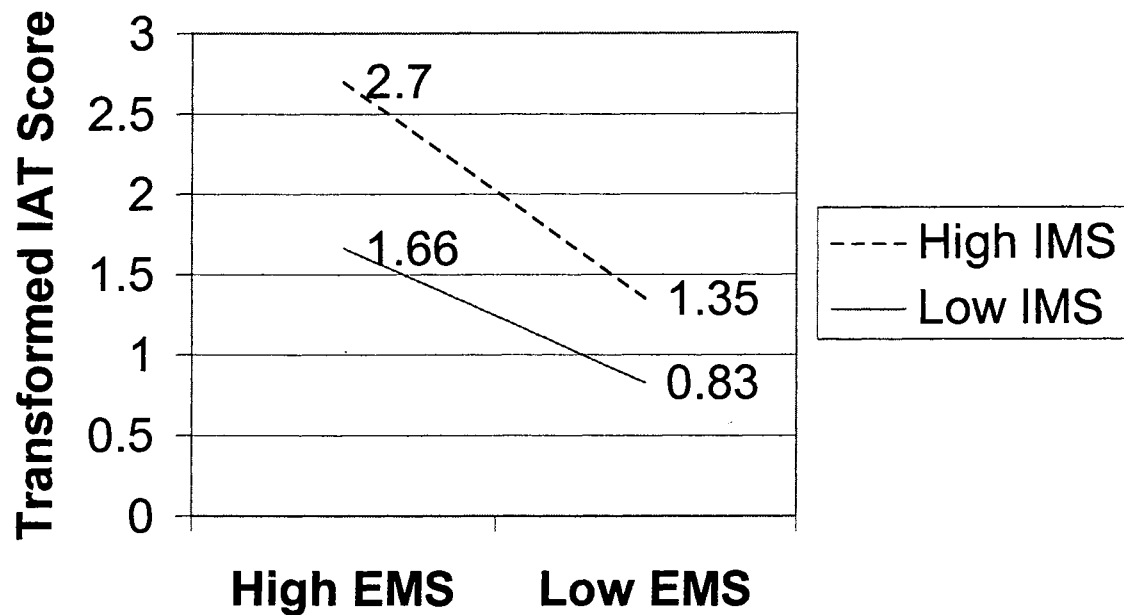
Factor	<i>b</i>	<i>SEb</i>	β	<i>t</i>
Group	-.37	.14	-.20	-2.56*
IMS	-.05	.05	-.08	-1.06
EMS	-.08	.05	-.13	-1.63
ISM x EMS	.05	.03	.75	2.08*

* $p < .05$

Note. IAT = Implicit Association Test. IMS = Internal Motivation to Respond Without Prejudice Scale. EMS = External Motivation to Respond Without Prejudice Scale.

Figure 1

Two-way Interaction of IMS and EMS on IAT Scores



Note. IMS = Internal Motivation to Respond Without Prejudice Scale. EMS = External Motivation to Respond Without Prejudice Scale. IAT = Implicit Association Test.

Summary of Results

The main hypothesis of the current study was not supported by the results. The manipulation intended to reduce bias with a public administration of the measures was effective. However, the externally motivated individuals who were expected to reduce their bias on both explicit and implicit measures were not responsible for the reduction. Secondary analyses were also conducted and indicated that internal motivation was strongly related to low explicit bias, as was sex and the number of relationships individuals reported with LGB individuals. Although the inability of external motivation to moderate the influence of

situation factors on bias does not follow theory (Devine et al., 2002), the performance of the measures and their relationship to each other was in line with expectations. In addition, the public/private manipulation clearly was effective. The deviation and congruence with expectations is further explored in the discussion.

DISCUSSION

The purpose of the current study was to examine the interaction of personal and situational influences on implicit attitudes. The amount of bias showed by individuals who were primarily motivated to be nonprejudiced for external reasons was expected to be significantly lower in public situations where they were under the scrutiny of others. Results did not conform with these expectations. Although implicit bias was reduced in a public situation, externally motivated individuals were not responsible for the change. Seemingly, the situation in which implicit attitudes are tested is important in a way that leads to a general reduction in bias, but not in the same way as has been illustrated with explicit attitudes by Plant and Devine (1998). The low IMS/high EMS group was not found to reduce their implicit bias as would be predicted from theory. In fact, the only interaction was a two-way interaction between IMS and EMS predicting IAT scores. Unfortunately, the inability to separate the IAT scores by group introduces a confound to this interaction. Therefore, with the major differences in the IAT administration between the public and private groups, the interaction cannot be meaningfully interpreted. With one group completing measures publicly and another privately a major confound was introduced that cannot be eliminated. Although these results do not fit with predictions stemming from Plant and Devine's theories about the IMS and EMS (Devine et al., 2002; Plant & Devine, 1998), the current study is the first ever to examine publicly assessed implicit bias and its relation to these scales, and thus, has been successful in identifying a situational variable that is important to the measurement of implicit bias.

Another expected result of the current study was to replicate past research in which externally motivated individuals reduced the amount of explicit bias they showed in a public

situation (Plant & Devine, 1998). Partially consistent with that research, responses on both the IHP and HS showed less bias when participants were forced to publicly state their answers to experimenters. However, once again, the situation was found to be important in that public statements of bias were reduced, but those who were motivated to be nonprejudiced for primarily external reasons were not responsible for the change. Strangely, in past research externally motivated participants (those who scored low in the IMS and high on the EMS) were the only group to significantly differ when reporting bias in public and private (Plant & Devine, 1998).

Even though the relationship between reduction of implicit bias in a public administration and motivation to respond without prejudice was equivocal, what is undeniable is that there was a very real reduction in IAT scores. The current study is only the second to focus on social motivation factors and their influence on implicit bias as measured by the IAT and the only study that has used a computer administered IAT to do so. In the other study, Lowery, et al. (2001) illustrated that implicit bias is reduced when an African American experimenter is in charge of administering the test using an pen and paper IAT. Even though external influences on the IAT are just beginning to be explored, Blair (2002) has illustrated that implicit attitudes are not the automatic entities they were once assumed to be. What this growing research trend indicates is, to some extent, implicit attitudes are vulnerable to the contemptible issues of self-presentation that make them such an attractive alternative to self-reports. Even though in the current study implicit attitudes were measured in a public situation where self-presentation issues would be at their most potent, implicit bias was still found and was related to explicit bias in the expected manner.

Similarity to Past Research

Although the results involving the EMS failed to conform with theory and past research, further examination of the results illustrates that the majority of findings fall in line with previous studies of implicit and explicit bias towards homosexuality. For example, people's implicit attitudes towards homosexuality have been clearly shown to be negative in previous studies (Banse, et al., 2001; Lemm, 2001; Steffens & Buchner, 2003), and IAT scores in the current study replicated those results. Whether taking the IAT in public or private, participants were slower in associating homosexuality with positive words than with negative words. A simple replication of an IAT effect is not the only evidence that the implicit measure was working. Additionally, IAT scores were significantly correlated with scores on an explicit measure of bias (IHP). Current thinking about the IAT is that it should result in scores that are correlated with explicit measures (Greenwald, et al., 2002), and implicit attitudes about homosexuality are no exception because they have been shown to exhibit the expected moderate but significant correlations to self-report measures of bias (Banse, et al., 2001; Lemm, 2001; Steffens & Buchner, 2003). So, performance of the implicit measure was similar to performance of past researchers' measures.

Results indicate that the explicit measures too were exhibiting the expected relationships among themselves and to demographic variables. For instance, internal motivation to respond without prejudice was found to be highly related to low levels of bias and past studies have shown that individuals who score high on the IMS and low on the EMS exhibit significantly less bias than other groups of scorers (Devine et al., 2002; Plant & Devine, 1998). For both of the current study's measures of explicit bias (IHP and HS), that relationship between internal motivation and low bias was supported. Consequently, although EMS scores did not predict bias level as hypothesized, IMS scores worked as expected.

The demographic variables sex and contact with LGB individuals were also found to have important relationships to the explicit measures. Males tend to have more negative attitudes towards homosexuality than women (Herek, 1996; 2000). Thus, it was no surprise to see that men on average reported bias nearly a standard deviation higher than women on both the IHP and HS. Another important predictor of attitudes towards homosexuality is past contact with LGB individuals (Herek, 2000; Herek & Glunt, 1993). Even though the extent or nature of the relationships was not assessed in this study, the simple self-reported number of LGB individuals that participants knew was still enough to be significantly related to lower bias. These relationships with demographic variables further illustrate that the present study's explicit measures were performing as expected.

In contrast to the explicit measures, demographic variables were not related to implicit bias, which could largely be expected. With regard to sex, the two studies that have examined the relationship between sex and implicit attitudes about homosexuality have found conflicting results. One study (Banse et al., 2001) found that men exhibited more implicit bias while another (Lemm, 2001) found no sex differences. No sex differences were found in our analysis, so further credence can be given to the notion that implicit bias towards homosexuality does not deviate by sex. Similarly, the number of relationships that participants reported having with LGB individuals was not correlated with implicit bias. Although one would expect that exposure to a minority group would reduce implicit bias (Rudman, et al., 2001), the low correlation between implicit and explicit attitudes about homosexuality (Banse et al., 2001; Lemm, 2001; Steffens & Bucher, 2003) and the poor psychometrics of a one-item measure most likely prevented any correlation in this case. To summarize the relationships between bias and demographic variables, the current study

advances the limited work that has been done with implicit bias and demographic variables and replicates relationships that have been seen with explicit bias and demographic variables.

Methodological Differences to Past Research

With the implicit and explicit measures performing as expected, differences found in the current study from past research must be addressed as a possible explanation for failure to replicate. One possible explanation for the failure of external motivation to predict reduction of either explicit or implicit bias might be the distribution of scores on the IMS and EMS that were seen in the current study. Previous researchers have used mass testing procedures to identify and recruit only those individuals who were in the top and bottom 30% of IMS and EMS scores in contrast to this study's methodology which simply used all volunteers. By recruiting only the top and bottom 30% of the distribution Devine et al. (2002) must have reduced the variability of their participant's IMS and EMS scores considerably. While the current study's scores would have much more variance, at the same time, the sample was also more ecologically valid.

The sampling differences in the current study could be construed as one of its strengths because of its attempt to generalize past findings in a more naturalistic sample. Although Plant and Devine (1998) found significant results with their mass testing sample, how ecologically valid was it? Past researchers have purposefully used only those individuals who are on the extremes of the IMS/EMS distributions (Amodio, et al., 2003; Devine et al., 2002; Plant & Devine, 1998; 2001). The current study attempted to replicate one of those studies with a more normally distributed sample and it was not possible. So, the reduction of bias found among individuals on the extremities of the IMS and EMS have yet to be demonstrated in a normally distributed population.

Another methodological difference between the studies is that in the past participants have been recruited because of their IMS/EMS scores, while in the present study their IMS and EMS were filled out with other measures during the study. Temporally pairing the IMS and EMS with the other measures of attitudes about homosexuality could have led to effects not present in past research that are impossible to control for. If the effects of taking the other measures did affect the IMS and EMS in ways that reduced their predictive power that is an important limitation the authors of the scales need to address. So far, the IMS and EMS have primarily been used as a mass testing tool to recruit individuals on the extremes of the distribution and have never been given as a dependant measure during an experiment (Amodio, et al., 2003; Devine et al., 2002; Plant & Devine, 1998; 2001). The usefulness of a study that can only be given in mass testing is questionable. Furthermore, not being able to pair a measure with other related scales is a flaw that eliminates nearly all utility it may have. Although the theoretical advancement represented by internal and external motivation to respond without prejudice is important, one must consider the utility of a theory when the primary measure of its constructs must be separated temporally from experimentation.

A final methodological difference of the current study was the dependant measures that were used to measure explicit bias. First, the current study used measures of bias while Plant and Devine (1998) used stereotypes. The relationship between stereotypes and prejudice is tentative (Dovidio, Brigham, Johnson, & Gaertner, 1996), so the effect this difference would have is unclear. Hopefully, the motivation to respond without prejudice construct would be valid with both prejudice and stereotypes. However, because of the kernel of truth in some stereotypes (Campbell, 1967), participants can be assumed to assent to more stereotypes in private than to bias. As such, bias may be less reactive than stereotypes.

Second, Plant and Devine (1998) used an ad hoc measure while the current study used two well-validated scales. Again, the effect of this difference is unclear, but surely, the methodological advantage must be given to the present study for the use of proven measures. To summarize the differences discussed so far, although the current study can be considered a replication of past research, several methodological deviations exist between it and past work. However, these differences are not necessarily limitations and are actually improvements in some cases. So, one must question the utility of the motivation to respond without prejudice theory and measures for studies such as this one because of their failure to produce meaningful results according to theory.

Implications

Theoretical implications of the current study involve the similarities of implicit attitudes as measured by the IAT and explicit attitudes. Slowly, research has emerged showing that the implicit attitudes measured by the IAT are more similar to explicit attitudes than had previously been imagined. First, the IAT was correlated with explicit measures. Second, learning experiences shaped implicit attitudes in the laboratory and real world. Finally, in the current study, implicit attitudes were significantly influenced if they were assessed in a public or private situation. Although specific types of motivation were expected to moderate this reduction, it seems that a general reduction occurs instead. This is disappointing, to some extent, because implicit measures were once hoped to be a measure of bias that was unrelated to the types of motivational and social desirability effects that make self-reports so difficult to interpret. Unfortunately, as the current study shows, assuming that individuals who are aware that they are being assessed for bias will be unable to influence

their scores on the IAT would be ignoring the growing similarity between explicit attitudes and implicit attitudes as measured by the IAT.

There are also positive and negative applied implications to the current research. To begin with the positive, there is clear evidence that individuals are consciously or unconsciously reducing their amount of implicit bias. Presumably then, individuals are also able to control some of the behavior that is based on these same implicit attitudes. The ability to control bias based on implicit attitudes seems most important for people with aversive prejudice. Those with aversive prejudice are considered to be individuals that accept egalitarian views but still possess subtle and unconscious bias towards minorities (Dovidio, et al., 2002). What this study shows is that the subtle, unconscious bias shown by people with aversive prejudice may be controlled in public situations, which gives hope that unbiased behavior can occur even among individuals assumed to have no control over their prejudice.

While it has been illustrated before that explicit bias is likely to be reduced in public (Plant & Devine, 1998), reducing implicit bias in a public situation is an entirely new concept that also has some negative implications. The negative side of the applied implications is that implicit bias was reduced in a public situation; therefore, in private situations implicit bias can be assumed to be more prevalent. Regrettably then, reductions in bias among individuals with aversive prejudice may occur only in situations of direct public observation while in private situations bias returns to a higher level. By way of a real life example, bias in the workplace is less likely to occur in face to face interactions with minorities but more likely to occur in private situations such as evaluations and promotion decisions. Unfortunately, in those private situations there are no public and private groups for comparison, so the bias likely to occur could go largely unnoticed. It follows then that by making interactions with

and evaluations of LGB individuals as open to public scrutiny as possible, some implicit bias will be avoided.

Limitations

A limitation of the study's methodology is its inability to eliminate alternative hypotheses for the drop in IAT scores. Although reductions in implicit bias are assumed to be due to motivation to appear nonprejudiced, an alternative could be the attention paid to the task. Perhaps in the private administration participants did not focus on the IAT because they did not know what its function was whereas in the public administration it was given more full attention. Similarly, effort is another possible explanation. Participants were under the impression that their IAT would produce a score after they finished in the public administration. Being aware of evaluation may have simply led to participants trying harder in the public administration. Extra effort could be important on the IAT in which motivation may lag after several hundred individual keystroke responses. Despite these possibilities, it is undeniable that explicit bias also dropped in the public condition, which cannot be accounted for by effort or attention. In addition, it is possible that motivation to be nonbiased and increased effort and attention are not mutually exclusive.

Future Research

An interesting next step in this line of research would be to determine exactly what processes are occurring to reduce implicit bias. If the participants were directly asked, some would likely be able to report the reticence to be biased that resulted in more positive responses about homosexuality on the explicit measures. In contrast, it would be impossible for them to report the complicated and precise response patterns that allowed for lower scores on the implicit measure. That reduction process can be assumed to be largely out of

conscious control because, as Banse et al. (2001) illustrated, people without knowledge of how the IAT works are not able to fake results in a certain direction. Perhaps the previously mentioned attention and effort factors are in fact working as mediators. They could be utilized by individuals who are concerned with appearing biased on the IAT. One way to address the issue would be to assign a secondary task that provides a cognitive load on participants. By assigning a cognitive load task, the ability of participants to use strategies to improve performance on the IAT would be greatly diminished. If the reduction in publicly administered implicit bias is lost with a cognitive load task, some evidence would accrue that effort and attention accounts for differences in bias between public and private administrations.

Another extension of the present research might be to examine if reductions in implicit behavioral bias occur in public as well. Behaviors such as eye gaze, friendliness in interactions, and seating distance from a target have been used to measure implicitly biased behavior towards a minority group member. However, just as was the case with measures in implicit attitudes before this study, participants were not aware of the evaluation. The logical assumption from the present research would be that if subtle biased attitudes can be altered in public situations, then subtle behaviors could be altered as well.

Conclusion

In conclusion, the results of this study show how implicit bias is significantly affected by testing situations. When measured in a public situation where individuals are aware that bias is being assessed and that others will see their results, implicit bias is reduced similarly to how explicit bias has been reduced in this and other studies. Motivation to respond without prejudice was not related to implicit bias in the way that theory would predict, but rather

there was a general trend to reduce bias when it was assessed publicly. Continued experimentation with the IMS and EMS is necessary, especially with more normally distributed populations, in order to determine if the theory extends beyond individuals with extreme scores on the measures.

REFERENCES

- Amodio, D. M., Harmon-Jones, E., & Devine, P. (2003). Individual differences in the activation and control of affective race bias as assessed by startle eyeblink and self-report. *Journal of Personality and Social Psychology, 84*, 738-753.
- Ashburn-Nardo, L., Voils, C. I., & Monteith, M. J. (2001). Implicit associations as the seed of intergroup bias: How easily do they take root? *Journal of Personality and Social Psychology, 81*, 789-799.
- Barrett, K. A., & McWhirter, B. T. (2002). Counselor trainees' perceptions of clients based on client sexual orientation. *Counselor Education and Supervision, 41*, 219-232.
- Banse, R., Seise, J., & Zerbes, N. (2001). Implicit attitudes towards homosexuality: Reliability, validity, and controllability of the IAT. *Zeitschrift für Experimentelle Psychologie, 48*, 15-169.
- Bellezza, W. F., Greenwald, A. G., & Banaji, M. R. (1996). Words high and low in pleasantness as rated by male and female college students. *Behavior Research, Methods, Instruments, & Computers, 18*, 299-303.
- Blair, I. V. (2002). The malleability of automatic stereotypes and prejudice. *Personality and Social Psychology Review, 6*, 242-261.
- Blanchard, F. A., Lilly, T., & Vaughn, L. A. (1991). Reducing the expression of racial prejudice. *Psychological Science, 2*, 101-105.
- Boysen, G. A., Vogel, D., Madon, S., & Wester, S. (2002). Mental health beliefs about gay males. Unpublished Manuscript.

- Brendel, C. M., Markman, A. B., & Messner, C. (2001). How do indirect measures of evaluation work? Evaluating the inference of prejudice in the implicit association test. *Journal of Personality and Social Psychology, 81*, 760-773.
- Campbell, D. T. (1967). Stereotypes and the perceptions of group differences. *American Psychologist, 22*, 817-829.
- Cunningham, W. A., Preacher, K. J., & Banaji, M. R. (2001). Implicit attitude measures: Consistency, stability, and convergent validity. *Psychological Science, 12*, 163-170.
- Dasgupta, N., McGhee, D. E., Greenwald, A. G., & Banaji, M. (2000). Automatic preferences for white Americans: Eliminating the familiarity explanation. *Journal of Experimental Social Psychology, 36*, 316-328.
- Dasgupta, N., & Greenwald, A. G. (2001). On the malleability of automatic attitudes: Combating prejudice with images of admired and disliked individuals. *Journal of Personality and Social Psychology, 81*, 800-814.
- Devine, P. G., Plant, E. A., Amodio, D. M., Harmon-Jones, E., & Vance, S. L. (2002). The regulation of explicit and implicit race bias: The role of motivation to respond without prejudice. *Journal of Personality and Social Psychology, 82*, 835-848.
- Dovidio, J. F., Brigham, J. C., Johnson, B. T., & Gaertner, S. L. (1996). Stereotyping, prejudice, and discrimination: A new look. In C. N. Macrae, C. Stangor, & M. Hewstone (Eds.), *Stereotypes and stereotyping* (pp. 276-319). New York: Guilford.
- Dovidio, J.F., Gaertner, S.L., Kawakami, K., & Hodson, G. (2002). Why can't we just get along? Interpersonal biases and interracial distrust. *Cultural Diversity and Ethnic Minority Psychology, 8*, 88-102.

- Dovidio, J.F., Kawakami, K., & Gaertner, S.L., (2002). Implicit and explicit prejudice and interracial interaction. *Journal of Personality and Social Psychology*, 82, 62-68.
- Fazio, R. H., Jackson, J. R., Dunton, B. C., & Williams, C. J. (1995). Variability in automatic activation as an unobtrusive measure of racial attitudes: A bona fide pipeline? *Journal of Personality and Social Psychology*, 69, 1013-1027.
- Gawronski, B. (2002). What does the Implicit Association Test measure? A test of the convergent and discriminant validity of prejudice-related IATs. *Experimental Psychology*, 49, 171-180.
- Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: Attitudes, self-esteem, and stereotypes. *Psychological Review*, 102, 4-27.
- Greenwald, A.G., McGhee, D.E., & Schwartz, J.L.K. (1998). Measuring individual differences in implicit cognition: The Implicit Association Test. *Journal of Personality and Social Psychology*, 74, 1464-1480.
- Greenwald, A. G., & Nosek, B. A. (2001). Health of the Implicit Association Tests at age 3. *Zeitschrift fur Experimentelle Psychologie*, 48, 85-93.
- Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2002). Scoring procedures to improve the Implicit Association Test measures. Unpublished Manuscript.
- Herek, G. M. (1996). Heterosexism and homophobia. In R. P. Cabaj & T. S. Stein (Eds.), *Textbook of homosexuality and mental health* (pp. 101-113). Washington D.C.: American Psychiatric Press.
- Herek, G. M. (2000). The psychology of sexual prejudice. *Current Directions in Psychological Science*, 9, 19-22.
- Herek, G. M., & Glunt, E. K. (1993). Interpersonal contact and heterosexual's attitudes

toward gay men: Results from a national survey. *The Journal of Sex Research*, 30, 239-244.

Hudson, W. W., & Rickets, W. A. (1980). A strategy for the measurement of homophobia. *Journal of Homosexuality*, 5, 357-372.

Karpinski, A., & Hilton, J. L. (2001). Attitudes and the implicit association test. *Journal of Personality and Social Psychology*, 81, 774-788.

Lemm, K. (2001). Personal and social motivation to respond without prejudice: Implications for implicit and explicit attitude and behavior. Unpublished Dissertation, Yale University.

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

Monteith, M. J., Deneen, N. E., & Tooman, G. D. (1996). The effect of social norm activation on the expression of opinions concerning gay men and Blacks. *Basic and Applied Social Psychology*, 18, 267-288.

Neumann, R., & Seibt, B. (2001). The structure of prejudice: Associative strength as a determinant of stereotype endorsement. *European Journal of Social Psychology*, 31, 609-620.

Nosek, B., Banaji, M.R., & Greenwald, A.G. (2002). Harvesting implicit group attitudes and beliefs from a demonstration web site. *Group Dynamics: Theory, Research, and Practice*, 6, 101-115.

Ottoway, S. A., Hayden, D. C., & Oakes, M. A. (2001). Implicit attitudes and racism: Effects of word familiarity and frequency on the implicit association test. *Social Cognition*, 19, 97-144.

- Park, J., & Bieschke, K.J. (2002). Development of the Heterosexism Scale. Poster presented at the Annual Convention of the American Psychological Association, Chicago. II.
- Plant, E. A., & Devine, P. G. (1998). Internal and external motivation to respond without prejudice. *Journal of Personality and Social Psychology, 75*, 811-832.
- Plant, E. A., & Devine, P. G. (2001). Responses to other-imposed pro-Black pressure: Acceptance or backlash? *Journal of Experimental Social Psychology, 37*, 486-501.
- Rudman, L. A., Ashmore, R. D., & Gary, M. L. (2001). "Unlearning" automatic biases: The malleability of implicit prejudice and stereotypes. *Journal of Personality and Social Psychology, 81*, 856-868.
- Steffens, M. C., & Bucher, A. (2003). Implicit Association Test: Separating transsituationally stable and variable components of attitudes toward gay men. *Experimental Psychology, 50*, 33-48.
- Yang, A. S. (1997). The polls—trends: Attitudes toward homosexuality. *Public Opinion Quarterly, 61*, 477-507.
- Young, M., Henderson, M. M., & Marx, D. (1990). Attitudes of nursing students toward patients with AIDS. *Psychological Reports, 67*, 491-497.
- Wittenbrink, B., Judd, C. M., & Park, C. M. (2001). Spontaneous prejudice in context: Variability in automatically activated attitudes. *Journal of Personality and Social Psychology, 81*, 815-827.

APPENDIX A

INDEX OF HOMOPHOBIA

This questionnaire is designed to measure the way you feel about working or associating with homosexuals. It is not a test, so there are no right or wrong answers. Answer each item as carefully and accurately as you can by placing a number by each question as follows.

- | 1 | 2 | 3 | 4 | 5 |
|----------------|-------|---------------------------|----------|-------------------|
| Strongly agree | Agree | Neither agree or disagree | Disagree | Strongly disagree |
1. ___ I would be comfortable working closely with a male homosexual.
 2. ___ I would enjoy attending social functions at which homosexuals were present.
 3. ___ I would feel uncomfortable if I found out that my neighbor was a homosexual.
 4. ___ If a member of my sex made a sexual advance toward me I would feel angry.
 5. ___ I would feel comfortable knowing that I was attractive to members of my own sex.
 6. ___ I would feel uncomfortable being seen in a gay bar.
 7. ___ I would feel comfortable if a member of my sex made an advance toward me.
 8. ___ I would be comfortable if I found myself attracted to a member of my sex.
 9. ___ I would feel disappointed if I learned that my child was a homosexual.
 10. ___ I would feel nervous being in a group of homosexuals.
 11. ___ I would feel comfortable knowing that my clergyman was a homosexual.
 12. ___ I would deny to members of my peer group that I had friends who were homosexual.
 13. ___ I would feel that I had failed as a parent if I learned that my child was gay.
 14. ___ If I saw two men holding hands in public I would be disgusted.
 15. ___ If a member of my own sex made an advance toward me I would be offended.
 16. ___ I would feel comfortable if I learned that my daughter's teacher was a lesbian.
 17. ___ I would feel uncomfortable if my spouse or partner was attracted to members of his or her same sex.
 18. ___ I would like my parents to know that I have gay friends.
 19. ___ I would feel uncomfortable kissing a friend of the same sex in public.
 20. ___ I would like to have friends of my sex who were homosexual.
 21. ___ If a member of my sex made an advance toward me I would wonder if I was a homosexual.
 22. ___ I would feel comfortable if I learned that that my best friend of the same sex was homosexual.
 23. ___ If a member of my sex made an advance towards me I would feel flattered.
 24. ___ I would feel uncomfortable knowing that my son's male teacher was homosexual.
 25. ___ I would feel comfortable working with a female homosexual.

APPENDIX B

HETEROSEXISM SCALE

Please answer the following questions with a 1 through 6 response. Please provide your honest opinion of each statement.

1	2	3	4	5	6
Strongly Disagree	Disagree	Slightly disagree	Slightly Agree	Agree	Strongly Agree

1. ___ All sexual orientations are natural expressions of human sexuality.
2. ___ Positive aspects of various sexual orientations should be included in public education.
3. ___ I believe that the lives of lesbian, gay, and bisexual individuals could not be as fulfilling as those of heterosexual individuals.
4. ___ Only heterosexual individuals are appropriate religious leaders.
5. ___ I think society will benefit from fostering equal opportunity employment for lesbian, gay, and bisexual individuals.
6. ___ Heterosexual couples make better candidates for parents than do same-sex couples for adoption.
7. ___ I would accept my sibling's partner regardless of his or her sex.
8. ___ No one sexual orientation is better than any other sexual orientation.
9. ___ An anti-discrimination law is incomplete without the inclusion of sexual orientation.
10. ___ There is no reason to restrict lesbian, gay, and bisexual individuals from working in the military.
11. ___ I think lesbian, gay, and bisexual individuals are unfit as teachers.
12. ___ My relationship with my son or daughter would remain the same even if I found out that he or she was romantically involved with a person of the same sex.
13. ___ I would not think less of my co-worker if I found out that he or she was a lesbian, gay, or bisexual individual.
14. ___ My relationship with my friend would change if I found out that he or she was not heterosexual.

15. ___ I make sure to invite the partner of my lesbian or gay friend to social functions.
16. ___ In general, heterosexual individuals are more psychologically adjusted than lesbian, gay, and bisexual individuals.
17. ___ Legalization of same-sex marriages will dismantle the fundamental foundations of society.

APPENDIX C

INTERNAL/EXTERNAL MOTIVATION TO RESPOND WITHOUT PREJUDICE SCALE

The following questions concern various reasons or motivations people might have for trying to respond in nonprejudiced ways toward gay males. Some of the reasons reflect internal–personal motivations whereas others reflect more external–social motivations. Of course, people may be motivated for both internal and external reasons; we want to emphasize that that neither type of motivation is by definition better than the other. In addition, we want to be clear that we are not evaluating you or your individual responses. All of your responses will be completely confidential. We are simply trying to get an idea of the motivations that students in general have for responding in prejudiced and nonprejudiced ways. If we are to learn anything useful, it is important that you respond to each of the questions openly and honestly. Please give your responses according to the scale below.

1	2	3	4	5	6	7	8	9
Strongly Disagree	Moderately Disagree	Slightly Disagree	Disagree	Neutral	Agree	Slightly Agree	Moderately Agree	Strongly Agree

1. ___ I am personally motivated by my beliefs to be nonprejudiced towards gay men, lesbians, and bisexuals.
2. ___ Being nonprejudiced towards gay men, lesbians, and bisexuals is important to my self-concept.
3. ___ If I acted prejudice towards gay men, lesbians, and bisexuals, I would be concerned that others would be angry with me.
4. ___ Because of my personal values, I believe that using stereotypes about gay men, lesbians, and bisexuals is wrong.
5. ___ I try to act nonprejudiced towards gay men, lesbians, and bisexuals because of pressure from others.
6. ___ I attempt to act in a nonprejudiced ways towards gay men, lesbians, and bisexuals because it is personally important to me.
7. ___ I try to hide any negative thoughts about gay men, lesbians, and bisexuals in order to avoid negative reactions from others.
8. ___ Because of today's PC (politically correct) standards I try to appear nonprejudiced towards gay men, lesbians, and bisexuals.
9. ___ I attempt to appear nonprejudiced towards gay men, lesbians, and bisexuals in order to avoid disapproval from others.

10. ___ According to my personal values, using stereotypes about gay men, lesbians, and bisexuals is OK.