

8-9-2010

# Strategies for Influencing Implicit Associations in Shooting Decisions: A Test of Longevity

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STRATEGIES FOR INFLUENCING IMPLICIT ASSOCIATIONS IN SHOOTING  
DECISIONS: A TEST OF LONGEVITY

A Dissertation Submitted to the School of Graduate Studies and Research in Partial  
Requirements for the Degree Doctor of Psychology

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August, 2010

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Previous research has indicated that participants often display bias on computer simulated “shoot”/“don’t shoot” tasks in which the race of the “suspect” and the object he holds are varied. For example, non-African-American participants have been found to “shoot” more unarmed African-American “suspects” than unarmed non-African-American suspects on these simulated tasks. In this study, participants were required to complete a shoot/don’t shoot task with the race of the suspect (i.e., non-African American or African American) and object the man is holding (i.e., gun or non-gun object) on the task as independent variables. That is, while completing the task, participants were required to make the decision to “shoot” or “don’t shoot” non-African-American and African-American men holding guns or non-gun objects (e.g., a cell phone) in a rapid manner (less than 630ms). Participants were also read a number of different instructions depending on their randomly assigned condition that have been found to affect performance on the task. Additionally, participants were required to complete the task a second time, approximately one week following their original participation in order to test the lasting effects of the instructions they read prior to completing the test initially. In total, 152 participants completed the task at Time 1. One-hundred-thirty-nine participants returned at Time 2. Based on the results, it is suggested that the instructions read prior to the task had a significant affect in two conditions. Participants who were instructed that the task was a measure of racial bias and that the majority of previous participants displayed bias on the task displayed increased bias on the task. Participants who were misinformed that most do not show bias on the task performed without bias. Participants responded similarly at both times.

## ACKNOWLEDGEMENTS

I would like to thank the students, faculty, and staff at Indiana University of Pennsylvania. Although many of their names do not appear in this writing, I have bounced many of my ideas off several individuals at IUP. In turn, they took time out of their busy schedules to guide me through this process. Additionally, without student participation in this study, the research would not have been possible to complete. Of course, I would like to thank the committee members of my dissertation. Without their support, the quality of this research would be lacking. Finally, I would like to thank my wife, Bambi, for putting up with me throughout this process. It has been a long journey, but *we* made it!

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## CHAPTER ONE: THE PROBLEM

On February 4, 1999, around midnight, a twenty-three year-old South-African immigrant named Amadou Diallo was shot multiple times and killed just outside his apartment in Bronx, NY (McFadden & Roane, 1999; Fritsch, 2000). Diallo was reportedly entering his apartment when four unidentified police officers drove past in an unmarked automobile. These officers reportedly noticed that Diallo matched a description of a serial rapist in the area. The officers assert that they identified themselves as NYPD police officers and ordered Diallo to stop and show his hands. Diallo in turn reached into his pocket and removed an object that was reportedly perceived to be a gun by the police officers. As he was removing the object from his pocket, the officers fired upon Diallo. After the smoke cleared, Diallo had been hit by nineteen of the forty-one shots fired by the four officers. Even more alarming than the forty-one shots fired at a single suspect was that Diallo was pulling out his wallet and not a gun. The police officers claimed that they were certain that Diallo was pulling out a weapon and not his wallet.

This event, along with the public outcry that stemmed from the incident, led to an almost immediate response by psychological researchers to help understand the processes that may have led to the misidentification of the innocuous object Diallo held as a gun. More specifically, research has focused on whether persons such as police officers may, under time-pressured situations, use the race of a suspect (i.e., African American) to help disambiguate whether an object is a gun or not (Payne, 2007). Correll, Park, Judd, & Wittenbrink (2002) raise a fundamental question: “Would police have responded differently if Diallo had been white?” Although we will never know, research has

provided some insight into the likely nature of the officers' decisions that night. The research discussed here was conducted in attempt to understand further the processes that may occur during the decision to shoot a suspect.

## CHAPTER TWO: REVIEW OF RELATED LITERATURE

Long before the Diallo incident, researchers studied whether or not race plays a role in ratings of the hostility of an ambiguous behavior (Duncan 1976; Sagar & Schofield, 1980). That is, does a stereotype of African Americans being hostile affect judgments of behavior (Duncan, 1976)? Duncan presented European-American participants with ambiguous “shove” behaviors made by either an African-American or a European-American person and asked participants to rate the behavior in terms of hostility. These participants rated the same ambiguous “shove” to be more hostile when it was performed by an African American than when it was performed by a European American (Duncan, 1976). In a similar study, using drawings and stories of either European-American people (i.e., children not shaded in) or African-American people (i.e., children shaded in), sixth-grade boys were asked to rate the aggressiveness or meanness of the ambiguous behaviors of the characters (Sagar & Schofield, 1980). Again, ratings of perceived hostility were higher for the same behavior of an African-American person than for a European-American person. Interestingly, Sagar and Schofield found that both African-American and European-American boys perceived an African-American person’s ambiguous behavior as more aggressive than a European-American person’s ambiguous behavior. Taken together, these findings suggest strongly that many people in this culture perceive an ambiguous behavior as more aggressive, hostile, or mean when it is performed by an African American than when it is performed by a European-American person.

One important aspect of the Duncan and Sagar and Schofield studies was that they used indirect measures of prejudice. That is, it is likely that the participants were

unaware that their prejudice was being measured because participants believed that they were rating only hostility. The researchers manipulated the race of the stimulus using a between-subjects method. Therefore, participants were likely unaware of the manipulation. Measuring racial bias or prejudice indirectly is important because participants often attempt to present themselves as unbiased or non-prejudiced due to the pressures of social desirability on self-report measures such as the Modern Racism Scale (McConahay, 1986). Another important reason to assess bias indirectly is because people may not have access to or be able to report important aspects of beliefs that may guide their behavior (Wilson, Lindsay, & Schooler 2000).

One strategy often employed by researchers to facilitate the delineation of psychological processes is to dichotomize them as either automatic or controlled. Researchers have provided criteria to distinguish between automatic and controlled processes. As Bargh (1994) defines them, automatic processes operate without conscious awareness, begin without intent, cannot be stopped once initiated, operate quickly, and do not compete with other operations for limited attentional resources. On the other hand, controlled processes are conscious, intentional, controllable, and are limited by the capacity of our attentional system. In general, people use controlled processes when they are sufficiently motivated and have sufficient time and cognitive resources to do so (Devine, 1989). Without sufficient motivation, time, and cognitive resources, people generally use automatic processes that operate outside of their awareness (Devine, 1989). For example, in a situation such as that faced by the police officers who shot and killed Amadou Diallo, they may have been forced to use an automatic process to disambiguate

the object that Diallo was holding due to the limited time frame to make the decision about whether or not to shoot.

One common strategy employed in the laboratory to encourage automatic processing is to force participants to respond so quickly that they do not have enough time to use controlled processing. In a classic study on automatic processing, Neely (1977) used a lexical decision task to measure automatic processes in the laboratory. In this task, participants were given strategies to help them decide whether or not the stimulus that followed the prime would be a word or not. For example, all participants were told if BIRD was the prime word then if the word that followed the prime was an actual word, it would most likely (i.e., 2/3 of the time) be a type of bird (i.e., semantically related). In addition, all participants were told that if BODY was the prime then if the word that followed was an actual word, it would most likely (i.e., 2/3 of the time) be a part of a building (i.e. semantically unrelated). For example, when an individual saw BIRD they should expect PARROT and if they saw BODY they should expect DOOR to follow. In the testing phase, Neely manipulated the time delay (i.e., 250 ms, 400 ms, 700 ms, or 2,000 ms) that occurred from the onset of the prime stimulus to the onset of the word/non-word stimulus. The results showed that when given sufficient time (i.e., 2000 ms) to process cognitively, participants performed equally well (i.e., correctly responded at similar rates) on both semantically-related primes and semantically-unrelated primes. When given insufficient time to process cognitively, however, participants performed worse when given semantically-unrelated primes than when given semantically-related primes. That is, people can process automatically a rule that is based on semantics; however, they cannot process automatically a rule that is based on novel (or non-

semantic) information. Neely was the first researcher to distinguish between and measure both controlled and automatic processing in a laboratory setting.

Higgins & King (1981) argue that automatic stereotypes are generally negative and well established because they develop during childhood. They are generally negative because children do not have the cognitive capacity to assess the validity of the negative information that is generally received. For example, the media (e.g., television programs) often depict African Americans as violent and hostile (Weigel, Kim, & Frost, 1995). Higgins and King argue that automatic stereotypes are more accessible than personal beliefs because of their long history. Therefore, under situations that do not allow controlled processing, many people will display biased associations regardless of their personal beliefs. Higgins and King argue that automatic stereotypes are applied without conscious effort whereas explicit attitudes are only displayed when people inhibit their automatic stereotypes and activate their personal beliefs. In summary, Higgins and King contend that most people have positive or neutral personal beliefs regarding most social categories; however, unless they can inhibit their automatic stereotypes and activate their personal beliefs, they will appear biased due to their negative automatic stereotypes.

Closely related to the concepts of controlled and automatic processing are the notions of explicit and implicit associations (Devine, 1989). An explicit attitude is an attitude or belief that results from controlled methods of processing. For example, self-report methods (e.g., the Modern Racism Scale) generally are designed to measure explicit associations. An implicit attitude is an attitude or belief that results from automatic methods of processing. For example, split-second decision tasks (e.g., the Implicit Association Test, IAT, Greenwald, McGhee, & Schwartz, 1998) are designed to

measure implicit associations. Devine conducted a series of studies to understand further the nature of implicit and explicit racial associations of both low- and high-prejudiced participants based on their scores on the Modern Racism Scale. The results of Study 1 supported the hypothesis of Higgins and King (1981) that both high- and low-explicit prejudice European-American participants have common core beliefs (i.e., automatic stereotypes) regarding African Americans. The results of Study 2, in which an unconscious priming task was used to activate automatic stereotypes and inhibit conscious monitoring of those stereotypes, revealed that both high- and low-explicit-prejudiced participants displayed similar levels of stereotype-congruent evaluation in rating ambiguous behaviors. In Study 3, when given sufficient cognitive processing time, only low-prejudiced persons inhibited their automatic stereotypes and activated their personal belief systems by expressing fewer pejorative thoughts and stressing equality. Taken together, the results suggest that most European-American people raised in the American culture possess similar negative core beliefs regarding African Americans and only when given sufficient time for conscious thought will people with low-prejudice explicit associations inhibit their automatic stereotypes and replace them with their personal beliefs.

Devine's results suggest that most European Americans have similar negative implicit associations and that there is no relationship between implicit and explicit associations. Wittenbrink, Judd, & Park (1997) developed a series of measures to test the validity of these claims. Along with having European American participants complete the Modern Racism Scale as an explicit measure of racial bias, participants completed a task similar to the IAT as an implicit measure. Participants showed varying levels of implicit

racial associations and their scores on the implicit measure were significantly correlated with those on the explicit measure. That is, Wittenbrink and her colleagues' findings were inconsistent with those of Devine. Previous research by Fazio, Jackson, Dunton, & Williams (1995) also generally supports the findings of Wittenbrink et al. (1997). Their research, along with other studies (e.g., Lepore & Brown, 1997; McConnell & Leibold, 2001) since Devine's classic work, supports the claim that people from the same culture can hold different levels of implicit racial bias. Additionally, Fazio et al. (1995) found that for individuals with a low motivation to control prejudice, explicit measures can be used to predict implicit measures of racial bias.

Although researchers in the field have developed a general consensus that there are varying levels of implicit racial bias among members of the same culture, less consensus has been found for the relationship between implicit and explicit measures (Nosek, Greenwald, & Banaji, 2007). For example, Wittenbrink and his colleagues found a significant positive correlation between explicit and implicit measures whereas Devine found none. Those who argue that there is no relationship between implicit and explicit measures consider the two to be distinct constructs (Wilson, et al., 2000). Fazio & Olson (2003), however argue for a single attitude construct with the only distinctions being the method of measurement. A recent meta-analysis based on a sample of 126 studies using the IAT and an explicit measure determined a mean effect size of .24, supporting a small positive relationship between implicit and explicit measures of racial associations (Hofmann, Gawronski, Geschwendner, Le, & Schmitt, 2005).

Deciding which type of measure to use (i.e., implicit vs. explicit) when measuring racial associations has recently received attention. Fazio & Olson (2003) argue

that the decision to use an implicit versus an explicit measure depends solely on the type of behavior being studied. For example, if one is studying a controlled, planned, or strategic behavior, then an explicit measure is more appropriate. If one is studying a spontaneous or split-second behavior, then an implicit measure is more appropriate. McConnell & Leibold (2001) argue that, in general, implicit measures should be used when attempting to measure highly emotional (e.g., racial) associations.

Implicit measures generally assess the strength of the associations people have between stimulus targets (e.g., an African-American face) and evaluative connotations (e.g., hostile, Greenwald & Banaji, 1995; Greenwald et al., 1998). They measure associations of which test-takers may be unaware or over which they may not have control. Implicit measures are often used to assess in-group favoritism and out-group antipathy. Laboratory research has shown implicit measures to be more predictive of discriminatory behavior toward minorities than explicit measures (McConnell & Leibold, 2001). The most common implicit measure of racial bias is the IAT (Greenwald et al., 1998). The IAT is used to measure response latencies to stimulus targets (e.g., African-American or European-American faces) and evaluative connotations (e.g., positive or negative words). Participants categorize stimuli using two possible keyboard responses, each mapped with two categories of stimuli. For example, during one trial block, African-American faces and negative words are mapped to one keyboard response and European-American faces and positive words are mapped to another keyboard response. During another trial block, European-American faces and negative words are mapped to one keyboard response and African-American faces and positive words are mapped to the other keyboard response. Researchers have found that a majority of European-American

participants categorize stimuli more quickly when African-American faces and negative words are mapped together and European-American faces and positive words are mapped together (Nosek et al., 2007). An IAT effect is defined as a mean difference in response latencies between the two sets of mappings. The larger the mean difference is, the greater the IAT effect is. Large IAT effects are indicative of strong associations in memory between the target and evaluative connotation. This suggests that the majority of European-American people in this culture have stronger associations between African-American faces and negative words and European-American faces and positive words (Nosek et al., 2007).

Using a computerized task that required both African-American and European American participants to discriminate between hand tools (innocuous objects) and guns (harmful objects) after a brief presentation of a human face, researchers found evidence for implicit associations (Payne, 2001). In this task, participants were required to press one key if they saw a gun and another key if they saw a tool. Just before an object appeared, however, an African-American or a European-American face flashed briefly on the screen. When no time constraints were applied, both European-American and African-American participants were highly accurate with both objects regardless of whether an African-American or European-American face had been presented, although they were able to distinguish guns more quickly after an African-American prime than after a European-American prime. In a second experiment, Payne attempted to measure implicit associations, using the same procedure except that he required participants to respond within a half a second on each trial. Using a Process Dissociation Procedure (Jacoby, 1991), Payne showed that under stringent time constraints, participants were

forced to respond using automatic processing. Participants' errors but not their response latencies were impacted. More specifically, participants were more likely to report incorrectly seeing a gun when a hand tool was primed with an African-American face than when primed with a European-American face. Based on these results, it appears that during split-second decisions, participants are more likely to misperceive an innocuous object as a gun when it is primed with an African-American face. Taken together, the results of these studies suggest that African-American faces prepare participants to identify a stimulus as a gun more than do European-American faces. Using an explicit measure of racism, Payne found no significant correlation between the automatic component in his task and the Modern Racism Scale. This relationship, however, was moderated by participant motivation to control prejudice scores, such that participants with low motivation showed a significant positive correlation between the explicit and automatic (implicit) measures. Recently, evidence has been found for a significant positive correlation between scores on this task and scores on the IAT (i.e., high scores on IAT were significantly related to high scores on the weapons task; Payne, 2005).

Correll et al. (2002) used a task that is conceptually similar but procedurally distinct from that used by Payne. In this "shoot/don't shoot task" (often referred to as "The Police Officer's Dilemma"), images of either African American or European American men holding either guns or non-gun objects appear one at a time on a computer screen. Participants are required to "shoot" (i.e., push the designated shoot key) when presented with images of men who are holding guns (i.e., a silver snub-nosed revolver or a black nine-mm pistol) or not "shoot" (i.e., push the designated "don't shoot" key) when presented with images of men holding innocuous objects (i.e., a black cell phone, a black

wallet, a silver aluminum can or a silver camera). Photographs of men are superimposed onto many varying backgrounds such as train stations or parks.

Consistent with the results of Payne's experiments, in Study 1, when given a significant amount of time to respond (i.e., 850 ms), Correll and his colleagues found that European-American participants responded with bias in reaction times but not in error rates. That is, participants made the correct decision to shoot an armed African-American man more quickly than they made the decision to shoot an armed European-American man. Additionally, participants made the correct decision to not shoot an unarmed European-American man more quickly than an unarmed African-American man. In Study 2, participants were given less time to respond, and showed a bias in error rates but not in reaction times. That is, they made the incorrect decision to shoot an unarmed African-American man more frequently than they made the incorrect decision to shoot an unarmed European-American man. Additionally, participants made the incorrect decision to not shoot an armed European-American man more frequently than an armed African-American man.

In Study 3, the results of Study 1 were replicated and, in addition, two explicit measures were shown to be significantly correlated with bias on the shoot/don't shoot task. More specifically, amount of contact with African Americans and perception of the cultural stereotype were significantly negatively correlated with bias whereas self-reported personal racial prejudice was not significantly correlated with bias. In Study 4 the results of Study 1 were replicated with twenty-five African Americans serving as participants. That is, African Americans displayed similar levels of bias on the task as did a group comprised primarily of European Americans. Overall, when given a significant

amount of time, both African-American and European-American participants can more quickly distinguish a gun from a non-gun object when it is held by an African-American man. Also, under time constraints, European American (African Americans were not studied) participants were more likely to make the incorrect decision to shoot an unarmed African-American man compared to an unarmed European-American man.

Greenwald, Oakes, & Hoffman (2003) employed a more animated task that required participants to shoot or not shoot at images of African-American or European-American men who appeared from behind obstacles. Participants were required to shoot only armed African-American “suspects”, during some phases of testing and to shoot only armed European-American “suspects” during other phases. The results were similar to those found by Payne and Correll and their colleagues. That is, participants displayed more errors with unarmed African-American men and distinguished a gun more quickly when it was held by an African-American man than when it was held by a European-American man. Payne (2007) argues that “Snap judgments didn’t change people’s stereotypes. Snap judgments allowed those stereotypes to spill out into overt behavioral errors.”

Thus, within three years of the Diallo shooting, the results of three different research programs employing different experimental paradigms provided strong converging evidence of implicit racial associations’ effect on simulated shooting decisions. These findings, along with others that followed, present a clear perception of what is often misperceived (i.e., a non-gun object as a gun) in shooting decisions regarding African-American “suspects.” Recent neuroscience research measuring event-related potentials has also provided preliminary insight into the psychological processes

involved in these decisions (Amodio, Harmon-Jones, Devine, Curtin, Harley, & Covert, 2004; Correll, Urland, & Ito, 2006). These studies suggest a neurological component in shooting decisions, especially with participants who display higher levels of bias in shooting decisions.

Research in the laboratory has provided strong evidence for the role of implicit (and explicit) racial associations in shooting decisions made by untrained European-American (and, in some cases, African-American) civilians. As will be discussed further, recent research with trained police officers has provided mixed results as to the nature of racial associations involved in their shooting decisions on these tasks (Correll, Park, Judd, Wittenbrink, Sadler, & Keesee, 2007; Plant & Peruche, 2005). Given the results of these studies and the possibility that police officers may use similar strategies to disambiguate potentially armed suspects, some of the laboratory research focus has shifted onto strategies that might attenuate the effects of these associations.

Initial strategies aimed at reducing racial bias in shooting decisions involved asking students to decide as quickly as possible whether or not objects presented to them were or were not guns. Some were instructed to pay attention to race in making their decisions, some were instructed not to pay attention to race in making their decisions, and others were given no instructions (control condition; Payne, Lambert, & Jacoby, 2002). Using the same experimental paradigm as that of Payne (2001), these researchers found that although participants in all three conditions showed bias, directing attention to race produced greater bias. That is, regardless of whether participants were directed to use race or not to use race to aid responses, the effect on performance was the same. Overall,

it is apparent that drawing participants' attention to race is likely an ineffective strategy for reducing shooter bias.

Plant, Peruche, & Butz (2005) found that continued exposure to their shooting task reduced bias on later trials for student participants. That is, after completing 160 trials, analyses revealed that participants performed significantly better (i.e., their overall accuracy was higher and they incorrectly shot similar percentages of black and white men) on the second half (i.e., the last 80 trials) of the task. Additionally, participants responded with similar non-biased levels 24 hours later. Plant and her colleagues argue that after repeated trials in which race was unrelated or non-predictive of the presence of a weapon, participants came to eliminate the automatic influence of race on their responses. Plant & Peruche (2005) found that this repeated-exposure strategy was also effective at eliminating racial biases initially held by sworn police officers. That is, police officers initially showed bias on the task; however, after extensive exposure to the paradigm, police officers performed without bias. This non-biased responding was maintained after 24 hours.

Peruche & Plant (2006) also found that police officers with negative beliefs regarding the criminality of African Americans were more likely to display greater bias initially on the task. Additionally, law enforcement officers who reported having had positive interactions with African Americans in their personal lives were most likely to eliminate their initial biases on the second half of the task.

Recent research conducted using a large sample of sworn police officers suggests that police officers may respond differently from other community members on a shoot/don't shoot task. In a series of studies, Correll et al., (2007) found that although

police officers and community members showed similar levels of bias in response time, police officers were significantly less likely to show response bias in their actual decision to shoot (i.e., error rates). This finding, although inconsistent with those of Plant and Peruche, was supported in two studies with officers from both the Denver area and a national sample using two different response criteria (i.e., 850ms and 630 ms). That is, police officers displayed levels of bias in response time (e.g., taking longer to respond to unarmed African-American men than to unarmed European-American men) similar to those of the community sample. Police officers' actual decisions to shoot, however, were not significantly influenced by the race of the target. They shot significantly fewer unarmed African-American men than the community sample and displayed similar rates of errors with both unarmed African-American and unarmed European-American men.

These results suggest that police training has little to no effect on response time to stereotype-incongruent stimuli (e.g., unarmed African-American or unarmed European-American men). In-depth-police practice and training, however, may allow police officers to respond without bias in their actual decisions to shoot. Additionally, Correll and his colleagues found that repeated exposure to their task decreased bias in the actual decision to shoot but not with response times. This effect, contrary to the findings of Plant and her colleagues, was not maintained over a 48-hour period. That is, participants were unable to maintain the non-biased responding patterns they displayed after repeated exposure to the task at Time 1 during Time 2, 48 hours later.

Inconsistency between the results of Correll and his colleagues and those of Plant and her colleagues suggests the need for continued research on police officers' levels of performance on these simulations. It may also be important to investigate the

development of skills that may allow police officers to respond without bias in shooting decisions on such tasks. That is, “Is police academy training sufficient to eliminate these biases on computer simulations (and perhaps during actual events) or is further experience and training necessary?” Continued research is also necessary to develop strategies to influence bias held by police officers and cadets. Even if police officers are able to respond without bias after training and experience on these tasks, developing strategies that are more parsimonious may be effective at reducing shooter bias with only minimal training rather than several days or weeks of training. The present research will focus on the impact of instructions (strategies) to influence bias on a shooting task both initially and over time.

In a series of recent studies, Watt, Sherburne, & Stires (2010) developed and tested multiple strategies for influencing bias on a version of Correll’s shoot/don’t shoot task. Based on findings of Payne et al. (2002) and Frantz, Cuddy, Burnett, Ray, and Hart (2004), several manipulations were performed. In Study 1, participants in a Threat African-American condition were told that the task measured racial bias and that most participants displayed such bias against African Americans. Frantz et al., found that when a similar manipulation was performed using the IAT, bias on the task was exacerbated. In a Threat European-American condition participants were told that the task measured racial bias and that most participants displayed such bias against European Americans. Participants in both conditions made the incorrect decision to shoot unarmed African Americans more often than those in a control condition in which race was not mentioned. That is, participants in the control condition displayed racial bias on the task; however,

those in both the African-American and European-American threat conditions displayed significantly more bias than those in the control condition.

One possible explanation for the African-American threat effect is that participants' awareness of the true nature of the task increased their arousal and that this increased arousal led to poorer performance with unarmed African-American stimuli. Frantz et al. (2004) described a similar finding on the IAT as being caused by a form of stereotype threat. European-American participants showed a larger bias on the race IAT if they were told that the test was a measure of bias. As traditionally defined, however, a stereotype threat effect occurs when a member of a minority population is reminded of his identity (e.g., race or sex) prior to completing a task in which the minority population to whom he belongs is believed to perform poorly. That is, a negative stereotype regarding his group's performance exists, he is aware of the stereotype, and the resulting anxiety (arousal) has a negative effect on performance.

Frantz et al. (2004) interpreted their results as consistent with results from stereotype-threat studies showing that the effect is exacerbated by reminding participants of their group membership. Although their participants were not members of a minority group, they argued that their participants were aware of the "stereotype" that European Americans are biased against African Americans and that being reminded of the "stereotype" caused anxiety (arousal) and made them perform poorly. It is not clear, however, why increased arousal would have led participants in the Frantz et al., study to perform poorly only with African-American stimuli. Similarly, it is not clear why increased arousal would have led participants in the current study to perform poorly only with unarmed African-American stimuli, rather than causing poorer performance overall.

Furthermore, the results of the European American threat manipulation are not reconcilable in an obvious way with the stereotype-threat hypothesis.

A more parsimonious account of both the results of Frantz et al., (2004) and the results of the threat manipulations reported here, as well as those reported by Payne (2002) would appear to involve activation of a bias already present. That is, if an implicit association between African Americans and negative words or guns already exists, mentioning race may activate the association and increase its effect on behavior.

In Study 2, Watt et al., (2010) showed that the “threat” bias could be eliminated with additional instructions. In a Threat + Attentional Focus condition, participants were first told that the task measured racial bias and that most participants displayed such bias against African Americans and then asked to focus only on the object (i.e., a gun or an innocuous object) the man was holding and not the man. Statistically, the Threat + Attentional Focus condition did not differ in bias from a control condition. Participants in an Attentional-Focus condition, who were told that the best way to complete the task without errors was to pay attention only to the object the man was holding, not only performed significantly more accurately overall than the control condition, but showed no racial bias.

Finally, participants in a No Threat-condition, who were told that people did not tend to show racial bias on the task, performed similarly to those in the Attentional Focus conditions: with high accuracy and no bias. Because the No Threat condition involved the mention of race, this finding, although consistent with the IAT results of Frantz and her colleagues seems inconsistent with the notion that mentioning race activates an association that increases bias. It also appears inconsistent with the findings of Payne

(2002) and with the results of the European-American threat manipulation described earlier (Watt, 2010). Participants in the latter two studies however, were not told that people tend to show no racial bias on the task. It may be the case that the (false) information that people tend to show no bias is believable and serves to focus attention on stimuli other than race, much as the direction to focus on the object does (i.e., Threat + Attentional Focus condition above). In any case, it appears that racial bias on a shoot/don't shoot task can be significantly influenced by simple manipulations in the instructions participants read before the task is administered.

In the present study, we further investigated strategies that might be used to influence bias on the shoot/don't shoot task. Specifically, participants were tested in Threat-African-American, Attentional-Focus, No-Threat, and No-Information conditions and were retested one week after these manipulations, under No-Information conditions (i.e., no additional instructions given). In addition, all participants were asked to complete the Modern Racism Scale, to report their gender and race, and to report their exposure to Malcolm Gladwell's book, *Blink*. Because *Blink* had been used recently as the freshman reader on the campus (i.e., many students in the subject pool may have been required to read it) and because the book included discussion of the results of research with "police officers' dilemma" tasks, we wanted to know if exposure might affect bias on the task.

Based on Watt and his colleagues' previous findings, we expected that participants in the *No-Information* condition (control group), in which only the standard task instructions were given, would display moderate levels of bias on the task at both Time 1 and Time 2. We expected that participants in the *Threat-African-American* condition, those told that the test usually showed bias against African Americans, would

display higher levels of bias than the No-Information participants at Time 1, and perhaps, at Time 2. We expected that participants in both the *Attentional-Focus* (i.e., told to focus on the object) and the *No-Threat* (i.e., told that the task did not assess bias) conditions would display high accuracy and little bias at Time 1, and perhaps at Time 2. Finally, we expected that there would be a small, but significant correlation between individuals' scores on the shoot/don't shoot task and the Modern Racism Scale. We expected no significant effects of exposure to *Blink*, race, or gender.

## CHAPTER THREE: PROCEDURES

One hundred fifty two participants were randomly selected from Indiana University of Pennsylvania General Psychology courses through the department subject pool and randomly assigned to one of the four conditions at Time 1. As a result, 39 participants were assigned to the No-Information condition, 38 to the No-Threat condition, 39 to the African-American Threat condition, and the 36 to the Attentional-Focus. At Time 2, 13 of these participants did not return to complete the shoot/don't shoot task for a second time and to complete the questionnaires. Of the remaining 139 participants, 34 (15 males, 19 females, 30 Caucasian, 3 African American, 1 did not identify) were in the No-Information condition, 34 (18 males, 16 females, 27 Caucasian, 4 African American, 2 Asian American, 1 mixed race), were in the No-Threat condition, 37 (20 males, 17 females, 29 Caucasian, 5 African American, 2 Asian American, 1 did not identify) were in the African-American Threat Condition, and 34 (15 males, 19 females, 26 Caucasian, 4 African American, 1 Asian American, 3 mixed race) were in the Attentional-Focus condition. Due to the nature of the study, participants were not asked to identify their race and gender until the second part of the study was completed.

We used a 2 x 2 x 2 x 4 mixed design with Race of the Stimulus (i.e., African-American Stimulus vs. European-American Stimulus, a within subject variable), Weapon Type (i.e., Gun vs. Innocuous Object, a within subject variable), Time (i.e., Time 1 vs. Time 2, a within subject variable) and Group (i.e., No Information vs. No Threat vs. Threat African American vs. Attentional Focus, a between subject variable) as factors.

The testing stimuli were provided by Joshua Correll and his colleagues. Stimuli consisted of 80 photographs of ten European American men and ten African American

men holding either one of two guns (i.e., a silver snub-nosed revolver or a black 9 mm pistol) or one of four innocuous objects (i.e., a black cell phone, a black wallet, a silver aluminum can, or a silver camera) and posed in one of five poses. Each of the men appeared four times, with each of the types of gun and with two of the ambiguous objects. The men appeared in different poses in each of the four photographs. Each of the weapon types appeared equally often in each of the five different poses. These photographs were superimposed on one of many different background types (e.g., parks, hotel entrances, restaurant entrances, sidewalks and train station terminals), such that no man appeared on the same background more than once. The backgrounds were chosen as possible places where police might have to decide whether to shoot or not shoot a possible suspect. See Appendix A for testing stimuli samples.

The stimuli described above were presented quasi-randomly (i.e., with the restriction that no man or background was presented on two consecutive trials) on a computer screen. The participants were instructed that she or he must respond "shoot" (push the 'A' key on the keyboard) or "don't shoot" (push the ';' key on the keyboard) as quickly as possible while trying to make as few errors as possible. Participants were instructed to push the "shoot" key when a man was holding a gun and to push the "don't shoot" key when a man was holding a non-gun object. A correct response (i.e., 'A' to a gun or ';' to a nongun) was immediately followed by another stimulus presentation. An incorrect response (i.e., ';' to a gun or 'A' to a nongun) was immediately followed by a brief presentation of a red 'X' and then another stimulus presentation. A time-out (i.e., failure to respond within 630 ms) resulted in a "timed-out" message and then another stimulus presentation. Reaction times (i.e., amount of time from appearance of the stimuli

until the participant "shoots" or doesn't "shoot"), correct responses, and incorrect responses were recorded.

At the beginning of the experiment, participants read through, signed, and received an Informed Consent Form (See Appendix B). Upon completion of the Informed Consent Form, participants were seated in front of a computer monitor, with a keyboard positioned slightly below the monitor. Participants were then given code numbers so that we were able to keep track of their scores. Participants were asked to keep their code numbers and bring them back when they returned for the second testing session. In order to identify the data from each condition and participant, No-Information participants were given code numbers between 1 and 38, No-Threat participants condition were given code numbers between 51 and 89, Threat-African-American participants were given code numbers between 101 and 139, and Attentional-Focus participants were given code numbers between 151 and 187.

Upon completion of the code number assignment, participants read one of the four set of instructions (see Appendix C) based on their assigned conditions. After receiving these instructions, the participants immediately read the standard task instructions (the No-Information condition instructions). The participants then completed the task as described above. Sixteen stimuli were presented as practice trials and participants were given response-latency feedback following these trials. They then completed the 80 trials of the actual experiment. Following the first testing session, all participants were scheduled to return approximately one week later for the second testing session. Participants who returned for the second testing session completed the shoot/don't shoot task a second time after reading only the general instructions (i.e., those

for the No Information condition at time 1). Upon completion of the task at time 2, participants were asked to complete an explicit measure of racism, the Modern Racism Scale (McConahay, 1986, see Appendix D). Participants were also asked to indicate their race and gender (see Appendix E). In addition, participants were asked about their exposure to the book *Blink* by Malcolm Gladwell. Finally, participants received a Debriefing Form (See Appendix F) and were encouraged to ask the experimenter any questions they had immediately prior to leaving the experiment.

## CHAPTER FOUR: DATA AND ANALYSIS

Following the work of Correll and his colleagues, latency data were initially trimmed by excluding all timed-out responses (i.e., responses not made within 630 ms) and incorrect responses. It is important to note that there were no significant differences across conditions in terms of number of timed-out responses. The resulting responses were statistically analyzed utilizing a repeated-measures Analysis of Variance (ANOVA) with Race of the Stimulus (i.e., African-American Stimulus vs. European-American Stimulus, a within subject variable), Weapon Type (i.e., Gun vs. Innocuous Object, a within subject variable), Time (i.e., Time 1 vs. Time 2, a within subject variable) and Group (i.e., No Information vs. No Threat vs. Threat African American vs. Attentional Focus, a between subject variable) as factors. There was a significant main effect of Weapon Type [ $F(1, 135) = 12.15$   $p < .001$ ], with participants responding faster to guns than non-gun objects. Effect size was estimated using partial-eta-squared, which was determined as .62. No violations of sphericity were determined following Mauchly's Test of Sphericity ( $W = .29$ ,  $p = .38$ ). Response latency means are provided in Table 1. Additionally, it is important to note that additional independent variables were also tested in the model. Gender and Race of the participant were initially entered as independent variables in this model and no significant main or interaction effects were determined. Therefore, these variables were not included in the final model.

Table 1

*Mean Latency Scores*

<b>Group</b>	<b>Stimulus Race</b>							
	<b>African American</b>				<b>European American</b>			
	<b>Weapon Type</b>							
	<b>Gun</b>		<b>Non-Gun</b>		<b>Gun</b>		<b>Non-Gun</b>	
	<b>Time</b>							
	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
A.A. Threat	563	552	572	563	561	565	582	572
No Info.	559	557	577	578	564	559	577	579
No Threat	553	559	562	577	555	546	562	574
Att. Focus	544	555	570	579	559	560	564	579

Again, following the work of Correll and his colleagues, error rate data were trimmed by eliminating all timed-out responses (i.e., responses greater than 630 ms). It is important to note that there were no significant differences across conditions in terms of number of timed-out responses. The resulting responses were analyzed using a repeated-measures ANOVA with Race of the Stimulus (i.e., African-American Stimulus vs. European-American Stimulus, a within subject variable), Weapon Type (i.e., Gun vs. Innocuous Object, a within subject variable), Time (i.e., Time 1 vs. Time 2, a within subject variable) and Group (i.e., No Information vs. No Threat vs. Threat African American vs. Attentional Focus, a between subject variable) as factors. The significant 3-way interaction of stimulus race x object x group [ $F(3, 135) = 16.661, p < .001$ ] was the

highest ordered significant interaction effect. Effect size was estimated using partial-eta-squared, which was determined as .77. No violations of sphericity were determined following Mauchly's Test of Sphericity ( $W = .24, p = .44$ ). The error rate cell means (presented as proportion correct) can be seen in Table 2. Again, it is important to note that Gender and Race of the participant were initially entered as independent variables in this model and no significant main or interaction effects were determined. Therefore, these variables were eliminated from the model and all results presented are based on a model without these variables.

Table 2

*Mean Accuracy Scores*

<b>Group</b>	<b>Stimulus Race</b>							
	<b>African American</b>				<b>European American</b>			
	<b>Object Type</b>							
	<b>Gun</b>		<b>Non-Gun</b>		<b>Gun</b>		<b>Non-Gun</b>	
	<b>Time</b>							
	<b>Time 1</b>	<b>Time 2</b>	<b>Time 1</b>	<b>Time 2</b>	<b>Time 1</b>	<b>Time 2</b>	<b>Time 1</b>	<b>Time 2</b>
A.A. Threat	.81	.85	.54	.56	.72	.73	.79	.77
No Info.	.81	.80	.66	.66	.73	.76	.76	.80
No Threat	.78	.84	.71	.75	.74	.77	.72	.74
Att. Focus	.79	.77	.63	.67	.72	.75	.72	.77

As recommended by Boik (1981), we conducted analyses for each of the simple effects to understand the causes of the significant 3-way interaction. Further analyses

revealed that the simple effect of Weapon Type x Group with European-American Stimulus was non-significant [ $F(3, 148) = 1.705, p = .168$ ] while the simple effect of Weapon Type x Group with African-American Stimulus was significant [ $F(3, 148) = 8.012, p < .001$ ]. Final analyses of the simple-simple effects revealed a non-significant simple-simple effect of Group with African-American Stimulus and Gun Objects [ $F(3, 148) = .338, p = .798$ ], while the simple-simple effect of Group with African-American Stimulus and Non-Gun Objects was significant [ $F(3, 148) = 13.415, p < .001$ ]. The cell means at this significant simple-simple effect are presented in Table 4. Due to there being four levels of the independent variable of Group, a Tukey HSD post-hoc test was performed to identify the group differences that caused the significant simple-simple effect. The results of the post-hoc analysis revealed that participants in the African-American-Threat condition scored significantly lower (i.e., performed worse) than the No Information condition ( $p = .001$ ) and the No-Threat condition ( $p < .001$ ) with African-American men holding non-gun objects. Participants in the No-Threat condition performed significantly better ( $p = .003$ ) than those in the Attentional-Focus condition. Additionally, results of the post-hoc analysis revealed that participants in the No-Threat condition scored marginally significantly higher ( $p = .081$ ) than the No-Information condition. Finally, participants in the African-American-Threat condition performed marginally significantly worse ( $p = .057$ ) than those in the Attentional-Focus condition.

Table 3

*Simple-Simple Effect at Group with African-American Stimuli Holding Non-Gun Objects*

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Proportion Correct:	
A.A. Threat	.55
No Info.	.66
No Threat	.73
Att. Focus	.65

It is important to note that the Weapon Type x Stimulus Race was found to be a significant two-way interaction. This is consistent with past studies conducted by researchers in the field; however, this interaction was not tested using simple effects due to the recommendation that only the highest-ordered interaction be analyzed using tests of simple effects (Boik, 1981). Of particular interest is the mean difference score between African-American and European-American men holding non-gun objects in the control condition. The cell means are presented in Table 4. This large mean difference suggests that participants in the control condition responded differently to these two types of stimuli, a result consistent with previous research using shoot/don't shoot tasks.

Table 4

*Mean Accuracy Scores at Two-Way Interaction of Weapon Type and Stimulus Race*

	<b>Stimulus Race</b>	
	African American	European American
<b>Weapon Type</b>		
Gun	.80	.74
Non-Gun	.65	.75

Participant responses on the Modern Racism Scale (McConahay, 1986) were initially scored for each participant. It is important to note the scores on this measure had minimal variability between participants. More specifically, participants generally self-reported minimal prejudice on this measure. Therefore, the lack of significant correlations with other measures may be due to the lack of variability on this measure. These scores were then correlated with participant accuracy scores on the shoot/don't shoot task. This analysis tested the relationship between participants' responses on explicit (i.e., the Modern Racism Scale) and implicit (i.e., the "shoot/don't shoot" task) measures. As previously noted, results in the literature have been mixed on the relationship between these two measures. We found no significant correlation between these variables ( $r = -.105$ ,  $p = .219$ ), however.

Finally, participants' exposure to *Blink* was not correlated significantly with either their accuracy scores on the shoot/don't shoot task ( $r = -.004$ ,  $p = .963$ ) or their scores on the MRS ( $r = .044$ ,  $p = .513$ ).

## CHAPTER FIVE: SUMMARY, CONCLUSIONS, RECOMMENDATIONS

Reaction time analyses revealed a significant main effect of Weapon Type, the only significant reaction-time effect determined following the ANOVA. This is a general finding in psychological literature: It is easier (and thus faster) to make a decision to shoot than it is to make the decision not to shoot. This finding was consistent with our hypotheses and the results of previous research suggesting that when participants are required to respond very rapidly (e.g., in less than 630 ms), few reaction-time differences are found. Higher-order significant differences have been found consistently in error rate data, however.

The error-rate results of the present study supported several of the initial hypotheses. On the shoot/don't shoot task, participants displayed different levels of bias toward unarmed men depending on the instructions they read prior to completing the task. For present purposes, bias is operationally defined as a mean difference in error rates for African-American and European-American stimuli. That is, participants responded differently to unarmed African-American men than they responded to unarmed European-American men depending on the instructions that were presented prior to the task. It is important to note that participants' errors did not differ depending on the task instructions with armed African-American stimuli, with armed European-American stimuli, or with unarmed European-American stimuli. That is, task instructions (as described in Appendix C) only affected the participants' responses toward unarmed African-American stimuli. Moreover, following the ANOVA and subsequent tests of simple effects and simple-simple effects, it was determined that participants "shot" more

or fewer unarmed African American stimuli on the task depending on the task instructions.

As predicted, participants who were informed of the true nature of the task (i.e., African-American-Threat-condition participants) made more incorrect decisions than those in the No-Information condition (our control condition) when deciding to “shoot” or not to “shoot” an unarmed-African-American stimulus on this task. These participants were informed prior to the task that it was a measure of racial bias and that the majority of past participants displayed bias. Participants in this condition made significant errors and made the decision to shoot almost as often as they did to not shoot (i.e., a 45% error rate) an unarmed African-American stimulus on this task. This effect is consistent with that reported by Watt et al., (2010) and remained one week later when participants performed at a similar level.

We also hypothesized that participants in the No-Threat condition who were misinformed that most participants do not show bias on the task would display minimal or no bias on the task. Consistent with this prediction, participants in this condition made the decision not to “shoot” at almost identical levels for African American and European American stimuli holding non-gun objects (i.e., (71% vs.72% correct at T1 and 75% vs. 74% at T2). Furthermore, these participants performed marginally significantly better (i.e.,  $p = .081$ ) with unarmed African American men holding non-gun objects than did the No-Information condition. This finding was also maintained over time as participants performed equally well on this task one week later. Additionally, this finding was consistent with Frantz and her colleagues’ findings in which participants who were misled to believe prior to taking the IAT that most participants performed without bias on

the task, displayed lower levels of bias. This finding is contradictory to the hypothesis that simply mentioning race will increase bias on an implicit measure of racial associations (Payne et al., 2002). In fact, race was mentioned several times in the instructions for this condition and the bias was decreased, rather than increased. The results of the No-Threat manipulation used in both the current study and by Watt et al., (2010) as well as those from the Threat + Focus manipulation used by Watt et al, suggest that the effect of any such activation may be countered with further instructions (i.e., that no bias is found on the task or that the participant should focus on the object).

We also hypothesized that participants in the Attentional-Focus condition would perform with less bias than those in the no-information condition. That is, we expected that by providing participants with a strategy to focus only on the object the man was holding and not the man, that this would increase their correct response rates toward African-American men holding non-gun objects. This hypothesis was developed following a recommendation made by Correll and his colleagues as a possible way of decreasing bias on the task. Although Watt et al. found that the manipulation was effective in eliminating bias, the effect was not replicated in the present study.. Participants in this condition displayed similar levels of bias as the No-Information condition at Time 1 and Time 2. That is, no significant differences were determined immediately or one week following. The inconsistency between the findings obtained by Watt et al. and those obtained in the current study suggest the need for further attempts at replication. Although it is possible that the results reported in the earlier study represent a Type 1 error, it is also possible that the manipulation used in the current study was ineffective for other reasons (e.g., participants' inattention to the instructions).

Another hypothesis that was supported was that participants in the no-information condition would show bias on the task. The two-way interaction of Weapon Type x Stimulus Race was found to be significant. Although this interaction was not tested using simple effects as previously noted, the mean difference score between African-American and European-American men holding non-gun objects in the control condition is large (see Table 3). This is consistent with past studies conducted by researchers in the field indicating reliability across measures, settings, and researchers.

The independent variable of Time was not determined to be significant. That is, participants performed in a similar manner (i.e., displayed similar levels of bias) when completing the task immediately following task instructions and approximately one week later. Mean error rates and latency responses were similar at both Time 1 and Time 2 (see Table 1 and 2). It should be noted that participants' performance in the Threat and No-Threat conditions on the task was significantly affected by the additional instructions they read at Time 1; however, this affect was not ameliorated one week later during Time 2 in which they only received the basic task instructions. That is, participants in these conditions displayed similar levels of bias on the task at both Time 1 and Time 2, suggesting relatively long-lasting effects of the instruction manipulations.

Participants' scores on the Modern Racism Scale (MRS) were predicted to be moderately positively correlated with performance on the shoot/don't shoot task. That is, participants who scored high on the MRS were expected to display relatively high levels of bias on the shoot/don't shoot task and those who scored low on the MRS were expected to display relatively low levels of bias on the shoot/don't shoot task. This hypothesis was not supported in the current study. No significant correlation existed

between scores on the two measures. In a field in which the results of numerous studies suggest significant inconsistencies between the relationship of implicit and explicit measures of racism/bias and small effect sizes (as previously noted), this finding is not surprising. This finding is consistent with those of previous researchers (e.g., Correll et al., 2002; Devine, 1989; Wilson et al., 2001); however it is inconsistent with those of several others (e.g., Lepore & Brown, 1997; McConnell & Leibold, 2001; Wittenbrink et al., 1997). Additionally, this finding may have been affected by the manipulations of instructions. That is, scores on the MRS were correlated with shoot/don't shoot performance and these scores were influenced by participants' conditions.

In the current study, we also attempted to assess any relationship between participants' exposure to a book in which implicit measures of racial bias were discussed (i.e., *Blink*) and participants' scores on the shoot/don't shoot task. As *Blink* is a national-bestselling book and it was assigned to many of the study participants as part of their academic instruction, we thought it possible that information gained from reading it might impact their performance on the shoot/don't shoot task. Exposure to *Blink* was found to have no effect on participants' performance, however. That is, neither participants' knowledge of the book's existence nor the number of pages (if any) from it that they had read affected their performance on the shoot/don't task. This is an interesting finding in that one of the messages from the book was very similar to the information participants in the African-American-Threat condition received prior to completing the task. It appears that when participants are given the information that they might present themselves as biased immediately prior to the task, participants did so both immediately and one week later. Simply reading that most individuals show bias in the

context of reading a book outside of the laboratory weeks, months, or years prior to taking an implicit measure of bias, however, did not appear to influence participants' scores. Additionally, exposure to Blink was not significantly correlated with scores on the explicit measure (i.e., the MRS). That is, having or not having knowledge that most individuals display bias on implicit measures of racial bias had no effect on participants' responses on the MRS.

The results of this study may be useful primarily in two areas: research methodology and psychological theory. Methodologically, based on the present findings, it is clear that a very simple modification in the content provided prior to participants' completion of an implicit measure may have significant effects on participants' performance. That is, in three of the four conditions, participants were given additional information regarding the nature of the shoot/don't shoot task. Participants' responses on the task were significantly impacted in two of these conditions. In both of these conditions, participants' responses were consistent with the information they read prior to the task. That is, participants who were told that most individuals showed bias on the task performed worse than the control condition (threat effect). Additionally, participants who were misled to believe that past participants did not show bias on the task displayed little or no bias. If future researchers are hoping to receive valid responses and results that reflect participants' actual implicit associations, it will be very important for those researchers to develop scripts that give basic instructions for the task and nothing else. When measuring responses to specific categories (e.g., race) using an implicit measure, it is important that the researcher not mention race, race categories, or give an indication of their expectations as to how participants will perform. Based on the results of this study,

along with other studies (e.g., Frantz et al., 2004), it appears that informing participants of how others have performed (whether or not it is true) may lead them, in some cases, to perform likewise.

Theoretically, the findings of this study do not fit nicely into any previous theory. As discussed earlier, the findings from the African-American-Threat condition do not seem to be best described as a stereotype threat effect. Additionally, the high error rate in this condition with regard to disambiguating the non-gun object when held by African Americans may be in some part due to expectancy effects. That is, although it is stated that most individuals show bias on this task, it may be implied that the experimenter “hopes” that they may not show bias (see Appendix C). Based on the results of this study alone, it is currently unclear to what degree, if any, that this effect is simply an expectancy effect. The results of Watt et al., (2010) suggest that this effect is not *merely* an expectancy effect (Watt et al., 2010). Misinforming participants that most participants showed a bias against European Americans (i.e., switching the words “Black” and “White” in the present African-American- Threat condition), resulted in performance virtually identical to that shown by participants in the African-American-Threat condition. That is, participants did not perform the way they were “expected to” perform. Taken together, these findings suggest that a new term is necessary to capture the findings from the African-American-Threat manipulation. The term “threat effect” is proposed to refer to the effect obtained here and that obtained by Frantz and her colleagues.

As simply mentioning race prior to an experiment and describing a likely outcome may influence participants’ behavior during an experiment, future researchers

should be careful in developing appropriate protocols for describing their experiments and the instructions to their participants. Additionally, past experimenters should examine their procedures to determine the likelihood that their findings might have been influenced by threat effects.

Although the results of this study may be useful methodologically and theoretically, practical applications to police training have not been established. We attempted to make this task as similar as possible to an actual police scenario. The conditions of an actual shooting decision cannot be replicated in the laboratory, however. That is, many variables beyond a suspect's race and whether or not he has a weapon are likely to be involved in police officers' shooting decisions. Simulations of the kind used in the present research, of necessity, have poor ecological validity.

In the case of Amadou Diallo, many variables other than race are necessary to understand why the officers chose to shoot him repeatedly. The environment and the officers' emotional states cannot be captured fully in laboratory experiments such as the ones described here. The present experiment took place in a quiet and well-lit college classroom in a rural community. Additionally, no participants reported significant stress or anxiety while completing the task. In the case of Diallo, police officers were reportedly in a poorly lit alley in Bronx, N.Y. at around midnight in a real-life situation in which anxiety was likely high. Anecdotally, many police officers report being in a "fight or flight" state when they are searching for or attempting to arrest a suspect. Despite these reservations about the generalizability of the results reported here, we hope that this work is a stepping-stone toward better understanding of police officer shooting decisions and that some of these findings might be tested for use in officer training simulations.

In attempting to understand the variables that are involved in police office shooting decisions, it is important to improve ecological validity. Future research must better replicate police officer's psychological state while also ensuring that the environment in the laboratory is similar to that in real-life situations. As affordable computer programming software improves, more life-like shooting decision programs can be developed to replicate the shooting environment. Replicating a police officer's emotional state with participants in the laboratory may be challenging due to Institutional Review Boards (IRB's). Researchers will need to be creative in finding ways to "cause" anxiety with participants in the laboratory setting that mimics a true shooting decision experience. However, until these variables can be controlled for in the laboratory, no valid and empirical understanding of what occurs in actual shooting decisions can be determined. Additionally, no practical recommendations for police training should be made without controlling for environmental- and psychological-state variables.

The current findings are consistent with many others in the field. These findings provide further support to a field attempting to understand implicit associations more completely. Researchers have determined strong psychometric properties for the IAT, the most commonly used implicit measure (Nosek et al., 2007). Despite these findings, this specialty field of implicit associations has been around for less than twenty years and has many critics. The current research provides further support for an implicit association between African Americans and weapons that many individuals in this society may possess. As participants have an increasing tendency to respond in a socially desirable on explicit measures, it is unlikely that they will express their true beliefs when simply asked. As acts such as that described in the case of Amadou Diallo occur, researchers

need to continue to be creative in determining ways to study complex behavior in the laboratory. Until researchers can control for important variables such as those described above, an incomplete understanding of behavior will remain. This study was useful in addressing methodological and theoretical issues in psychology, but many questions remain.

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**Appendix A**  
**Stimulus Examples**



## **Appendix B Informed Consent Form**

You are invited to participate in a research project. The purpose of this form is to inform you of the type of study that is being conducted and to obtain your consent to participate.

If you agree to participate in this experiment, you will be asked to read a set of instructions and then to respond rapidly to a series of pictures simulating a police officer's dilemma. Pictures of men will appear on the screen. The men will be either holding a gun or a harmless object. You will be asked to respond to the pictures by pressing on the two keys labeled "shoot" or "don't shoot". Your responses will be completely confidential. The experiment will take approximately 7-12 minutes. All data will be stored using a code number that you will be assigned during the experiment.

This research project includes two parts; today's study and a similar task in approximately two days. Agreeing to participate in this study includes both tasks.

Your participation in this experiment is completely voluntary. Whether you agree to participate in this study and your performance in it has no bearing on any evaluation you might receive from your psychology course.

It is possible that you will experience some mild anxiety while performing this task. You are free to withdraw from this study at any time without questions or penalties. To withdraw from this study, simply notify the experimenter that you no longer choose to participate. If you choose to withdraw, all data pertaining to you will be destroyed.

If you are willing to participate in this study, please sign the statement below and hand the signed copy to the experimenter. Please take the extra copy with you. If you choose not to participate, please return the unsigned copy to the experimenter.

If you have any questions about this experiment you may contact the student researcher or either of the project directors at the phone numbers or email addresses below.

This project has been approved by the Indiana University of Pennsylvania Institutional Review Board for the Protection of Human Subjects (Phone: 724-357-7730).

Projector Director 1:  
Dr. Cora Lou Sherburne  
Psychology Department  
105 Uhler Hall  
Indiana, PA 15705  
Phone: 724-357-2723  
Email: [sherburl@iup.edu](mailto:sherburl@iup.edu)

Project Director 2:  
Dr. Lloyd Stires  
Psychology Department  
302 Uhler Hall  
Indiana, PA 15705 I  
Phone: 724-357-2579  
Email: [lstires@iup.edu](mailto:lstires@iup.edu)

Student Researcher:  
Joshua Watt  
Psychology Department  
Uhler Hall  
Indiana, PA 15705  
Phone: 814-939-9152  
Email: [nqhl@iup.edu](mailto:nqhl@iup.edu)

VOLUNTARY CONSENT FORM:

I have read and understand the information on the form and I consent to volunteer to be a participant in this study. I understand that my information will be kept completely confidential and that I have the right to withdraw at any time. I have received the unsigned copy of this Informed Consent Form to keep in my possession.

Name (PLEASE PRINT)

Signature

Date

I certify that I have explained to the above individual the nature and purpose, the potential benefits, and the possible risks associated with participating in this research study, have answered any questions that have been raised, and have witnessed the above signature.

\_\_\_\_\_

Date

\_\_\_\_\_

Investigator's Signature

## **Appendix C Task Instructions**

### **Level 1: No Information**

In this task, pictures of men holding either a gun or another object (i.e, a soda can, a wallet, or a cell phone) will appear one at a time on the screen. You are to "shoot" the man if he is holding a gun and not "shoot" the man if he is holding one of the other objects.

You will need to decide as quickly as possible whether the object the man is holding is a gun or not. If it is a gun, the man poses an imminent danger, and you need to shoot him as quickly as possible by pushing the " A " key on the computer keyboard. If he is holding some object other than a gun, he poses no danger, and you need to press the " ; " key on the computer keyboard as quickly as possible.

In both cases, it is important that you respond fast and make as few mistakes as possible. If you don't respond fast (i.e., if you don't respond within 630 ms) you will receive a "timed out" message. If you make a mistake, you'll see a brief red "x" presented. Don't try to correct them. Just look out for the next target, which will come up quickly. Remember, the object of the task is to respond as quickly as possible with making as few of mistakes as possible.

The first 16 targets you see will be for practice. You will be given a brief break after they are completed. You will then be prompted to push the space bar whenever you are ready to begin the experimental targets.

If you haven't done so already, place your index fingers on the " A " and " ; " keys now, using your left hand for the " A " key and your right hand for the " ; " key. Rest your fingers on these keys between trials.

If you have any questions, ask the experimenter now. Otherwise, press the space bar to begin

### **Level 2: No Threat**

The following task will measure your response times and error rates as you decide whether to “shoot” or “not shoot” Black and White men holding either guns or harmless objects. It is a measure of racial bias. We are interested in measuring your unconscious racial attitudes toward African Americans and European Americans as accurately as possible. Research shows that on this task a high percentage of White people do not discriminate against White or Black people in this situation. For example, they are no more likely to “shoot” an unarmed White man than they are to shoot an unarmed Black man. Please try hard to help us in our analysis of individuals’ racial attitudes.

### **Level 3: Threat African American**

The following task will measure your response times and error rates as you decide whether to “shoot” or “not shoot” Black and White men holding either guns or harmless objects. It is a measure of racial bias. We are interested in measuring your unconscious racial attitudes toward African Americans and European Americans as accurately as possible. Research shows that on this task a high percentage of White people discriminate against Black people in this situation. For example, they are more likely to “shoot” an unarmed Black man than an unarmed White man. Please try hard to help us in our analysis of individuals’ racial attitudes.

### **Level 4: Attentional Focus**

The following task will measure your response times and error rates as you decide whether to “shoot” or “not shoot” men holding either guns or harmless objects. Recent

research suggests that during this task, many participants make errors in their decisions. That is, they “shoot” unarmed men and fail to “shoot” armed men. Researchers have suggested that these errors can be avoided if you concentrate on looking *only at the object the man is holding* when making your decision to “shoot” or “not shoot,” and *not at anything else*. Please try hard to help us in our analysis of how to avoid errors on this task.

**Appendix D**  
**Modern Racism Scale (McConahay, 1986)**

**Modern Racism Scale**

Indicate how much you agree or disagree with the following statements:

Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
-2	-1	0	1	2

\_\_\_\_\_ It is easy to understand the anger of black people in America.

\_\_\_\_\_ Blacks have more influence upon school desegregation plans than they ought to have.

\_\_\_\_\_ Blacks are getting too demanding in their push for equal rights.

\_\_\_\_\_ Over the past few years blacks have gotten more economically than they deserve.

\_\_\_\_\_ Over the past few years the government and news media have shown more respect to blacks than they deserve.

\_\_\_\_\_ Blacks should not push themselves where they're not wanted.

\_\_\_\_\_ Discrimination against blacks is no longer a problem in the United States.

**Appendix E**  
**Race and Ethnicity, and Gender Question**

Please indicate your race by checking as many of the following categories that apply.

- White
- Black or African-American
- American Indian or Alaska Native
- Asian, including Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese and other Asian
- Native Hawaiian, Guamanian or Chamorro, Samoan and other Pacific Islander
- Some other race

Please indicate your ethnicity by checking one of the following two categories.

- Hispanic or Latino
- Not Hispanic or Latino

Please indicate your gender by checking one of the following two categories.

- Female
- Male
- Other

## **Appendix F Debriefing Form**

Thank you for taking the time to participate in this study.

Previous research using the shoot/don't shoot task that you have completed has shown that college students react differently to African-American men than they do to European-American men. They shoot at a target more quickly when it is an African-American man holding a gun than when it is a European-American man holding a gun. They also shoot more African-American men who are not holding guns than they shoot European-American men not holding guns.

The purpose of this study was to test the hypothesis that the instructions you read prior to this implicit racial bias test affected your level of bias on the task. Some of you participated in the no-information condition in which you were only given the task instructions. Others were assigned to the threat African American condition in which you were told that the purpose of the study was to measure racial bias and that most people showed biases against African-American men. Others participated in the no threat condition in which we told participants that the task was designed to measure racial bias but that most individuals did not show any bias on the task. This was not true. We told you this to test whether you would respond differently from the individuals in the threat African American condition, in which we expected that a stereotype would be primed. Others participated in the attentional focus condition in which we told you to focus only on the weapon and not on anything else when making your decision to shoot. We expect that, although most participants will show a bias against African Americans, persons in the threat condition will show the most bias, and that participants in the no threat and the attentional focus groups would show the least bias.

If this experience has caused you distress we recommend that you contact the following places:

IUP Center for Counseling and Psychological Services  
Pratt Hall, Room 307  
201 Pratt Drive  
Indiana, PA 15705  
724-357-2621

or

The Open Door  
334 Philadelphia Street  
Indiana, PA 15767  
724-465-2605

If you are interested in this topic and would like to learn more about it, please consult the following references:

Correll, J., Park, B., Judd, C., & Wittenbrink, B. (2002). The police officers dilemma: Using ethnicity to disambiguate potentially threatening individuals. *Journal of Personality and Social Psychology*, *83*, 1314-1329.

Greenwald, A., Oakes, M., & Hoffman, H. (2003). Targets of discrimination: Effects of race on responses to weapons holders. *Journal of Experimental Social Psychology*, *39*, 399-405.

Frantz, C., Cuddy, A., Burnett, M., Ray, H., & Hart, A. (2004). A threat in the computer: The Race Implicit Association Test as a stereotype threat response. *Journal of Psychological Science*, *30*, *12*, 1611-1624.