

The Role of Multiple Racial Stereotypes in Simulated Shooting Decisions

by

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Abstract

In the United States there is a negative bias towards Black targets compared to White targets in simulated shooting decisions. The opposite trend has been found in unpublished research within Canada, but this may be because the purpose of these studies was clear to participants and thus, they overcorrected for their Black biases. To determine if this issue explains the White shooting bias sometimes found in Canada, and to make simulated shooting research more realistic, this study presented targets with multiple racial groups in a simulated shooting task. More specifically, 89 undergraduate student participants were presented with armed or unarmed Black, White, Middle Eastern and Asian targets and were instructed to shoot all armed targets, but to refrain from shooting all unarmed targets (in a 630 ms response window). It was anticipated that participants would present a negative shooting bias towards Black and Middle Eastern targets based on previous research that has found these groups to be associated with danger stereotypes. The results of the study were mixed, but the clearest findings related to a positive bias toward Asian targets. For example, participants set the highest shooting criteria for Asian targets (i.e., were reluctant to shoot) and made significantly more errors when Asian targets were armed (the opposite was found for all the other races). Interestingly, no strong pattern of relationships were found between an index of shooting bias for each of the races and explicit measures of racial stereotypes, in-group identification, and motivation to control prejudiced reactions. Limitations of this study are discussed along with lines of future research.

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The Role of Multiple Racial Stereotypes in Simulated Shooting Decisions

The purpose of this thesis is to examine the role of racial stereotypes in simulated shooting decisions. This research is fueled by real-world police errors, where racial stereotypes may have influenced the outcome of use-of-force encounters. One tragic example comes from New York City in 1999. Amadou Diallo, a West African immigrant, was shot and killed by police officers who were seeking a man with a similar physical profile. When police spotted him they ordered him to remain still. Instead, he reached into his pocket to grab his wallet for identification (perhaps he did not understand what the officers were saying). As he pulled out his wallet the officers shot and killed him, misperceiving his wallet as a weapon.

Incidents like this leave people (including researchers) with many questions: How could trained officers misidentify a wallet? What sorts of variables contributed to the misidentification? And mainly, how can these sorts of incidents be prevented in the future? In recent years police researchers have become interested in how extraneous cues (e.g., shooter mood, target gender, background noise) influence shooting decisions. The most important cue when making a shooting decision should be if the suspect is armed. However, research has continually shown that other variables can influence shooting decisions in simulated settings. Understanding why certain variables contribute to shooting errors may lead to ways of minimizing their impact (e.g., through training).

This thesis builds upon previous research that has examined target race as a variable that might influence shooting decisions (e.g., Correll, Park, Judd, & Wittenbrink, 2002; Correll et al., 2007a; Harmer, Stark, Taylor, & Bennell, 2011). With previous research focusing almost entirely on Black and White targets, the current study introduced a new element to this research by using

multiple races (Black, White, East Asian, and Middle Eastern) simultaneously in a single study. The decision to rely on multiple racial groups was driven by three primary factors.

First, because the current study was conducted in a Canadian context (nearly all previous research has been conducted in the U.S.) racial groups which go beyond Blacks and Whites are important to consider. Indeed, Canada is incredibly multicultural (Statistics Canada, 2010a) and visible minorities are increasingly represented within the population, especially in large cities (e.g., Vancouver, Toronto, Montreal). Because of this, Canadian law enforcement officers are required to make use-of-force decisions frequently across each of the racial groups being examined in this study (Wortley & Tanner, 2004), which include Black, White, East Asian, and Middle Eastern targets.¹ By including targets that represent each of these racial groups, this study becomes more realistic and hopefully more generalizable to naturalistic police settings in Canada.

Second, and related, Canadians appear to possess certain stereotypes towards the various racial groups included in this study (e.g., Berry & Kalin, 1995), which may influence their split-second shooting decisions. Thus, including multiple racial groups is interesting from a purely psychological perspective. Many of these stereotypes may not exist within an American context, or may not be as readily apparent, thus explaining the fact that researchers in the U.S. have consistently examined just the Black-White distinction. Stereotypes may exist for Middle Eastern individuals as well as East Asian individuals; both highly represented racial groups within Canada (Statistics Canada, 2010a).

¹ Of course other ethnic groups also exist in Canada, most notably Aboriginal people. The intent was to include Aboriginals in the current study, but for reasons discussed in the Methods section they could not be included.

Finally, beyond issues of realism and psychological interest, there is methodological value in including multiple races in a single study. Attempts have frequently been made in previous shooting research to conceal the nature of the shooting study so that participants are not primed to respond in a particular way. Routinely, race is not mentioned in the pre-study instructions, for example, so as not to influence participant responses (e.g., Correll et al., 2002; Bennell & Taylor, 2010). Such attempts at deception are important given that knowledge of race-based shooting tasks can influence shooting responses (Mendoza, Gollwitzer, & Amodio, 2010). However, even when attempts are made to deceive in these ways it is unlikely that participants do not figure out the purpose of the study once they are exposed to the shooting task (when one encounters only Black and White suspects, what purpose could there be other than to examine the influence of Black and White stereotypes?). Using a representative range of targets was expected to increase realism and disguise the nature of the experiment.

Before presenting the details of the proposed study, a literature review is presented. Initially, stereotype literature, in particular racial stereotype literature will be focused on, including a discussion of where stereotypes come from and how they are maintained. Then the discussion will move on to how stereotypes influence perception and behaviour, focusing specifically on simulated shooting behaviour. The justification for the use of multiple races in this study will then be expanded upon.

Stereotypes

The term stereotype often gets confused with related terms, such as prejudice or discrimination, but all of these terms represent different things. According to Hilton & von Hippel (1996) a stereotype is a widely held belief that people of particular groups have certain characteristics because of their group membership. Prejudice on the other hand is the agreement

with these stereotypes that lead to an emotional reaction (Corrigan & Watson, 2002). Finally, the negative behaviours that are presented when people act on their prejudices or apply their stereotypes are referred to as discrimination (Dovidio, Hewstone, Glick, & Esses, 2010). Thus, when taken together stereotypes, prejudice, and discrimination are considered the cognitive, affective, and behavioural components of out-group bias (Myers & Smith, 2009). These constructs represent, respectively, what people believe about a group, how they feel towards a group, and how they act towards members of that group. It is important to understand that while these concepts often co-exist, they do not always. For example, people can possess stereotypes and hold prejudicial views, but not act on those stereotypes or prejudices (i.e., not discriminate). Likewise, stereotypes may develop without any prejudice associated with them. For instance, people tend to assume a cheerleader is female, but there is not necessarily a positive or negative prejudice associated with this stereotype.

Stereotype Development

Stereotypes develop for various reasons and various theories of stereotype development have been proposed. For example, Tajfel and Turner (1979) proposed social identity theory, which hypothesizes that stereotypes develop out of a natural tendency for human beings to categorize, identify, and compare. They suggest that from a young age people learn to categorize people (and objects) based on different things, such as careers, gender, race, etc. By categorizing things people create schemas that aid in understanding the world around them, and making it easier to know how to interact with various things and people. Individuals also learn to categorize themselves in order to determine what groups to associate with (their in-group) based on their similarities with others. According to social identity theory, the characteristics associated with this in-group largely form a person's social identity. Finally, individuals compare their own

in-groups with other groups (referred to as out-groups). Individuals tend to have a favourable bias towards those who are similar to them and belong to the same in-group because this helps to maintain a high level of self-esteem (e.g., when people believe that those similar to themselves are superior this helps to build a strong social identity). This categorizing, identifying, and grouping process can create biases and stereotypes towards all out-group members by assuming that all members of these groups are similar.

Another popular theory relating to the development of stereotypes is categorization theory, which comes from a cognitive perspective. Various researchers have found instances in which individuals tend to rely heavily on stereotypes for cognitive ease (i.e., by categorizing things or people into groups, and assuming that all group members share similar characteristics, and can thus be treated the same, one can conserve limited cognitive resources). Kaplan, Wanshula, and Zanna (1993) found that when individuals are pressed for time they are more likely to rely on stereotypes for efficiency. For example, when people have a quick first meeting with someone they may not have the time to get to know the person so instead they rely on stereotypes to form a first impression. Similarly, Bodenhausen (1990) found that when individuals are tired they may rely on stereotypes because they are easy and efficient heuristics that require less cognitive effort. When people rely on these cognitive heuristics (i.e., stereotypes) they may not even realize they are doing so (Moreno & Bodenhausen, 1999); that is, stereotype activation can occur automatically due to cognitive restraints (e.g., due to time, energy, age, etc; Bodenhausen, 1990; Kaplan et al., 1993).

Stereotype Maintenance

There are many factors that may maintain an individual's stereotypes, but one of the most important factors is the media. For example, with respect the sorts of stereotypes that are relevant

to the current study, the media plays a large role in depicting certain racial groups as criminals (Gilliam, Iyengar, Simon, & Wright, 1996). For example, Dixon and Linz (2000) found through their content analysis of television news programs that both Black and Latino individuals are more likely to be portrayed as lawbreakers than as defenders, whereas the reverse is true for White individuals. Similarly, the Royal Commission on Aboriginal Peoples (1996) found that news depictions of Natives in Canada tend to focus on negative incidents, such as violence, and ignore some of the core beliefs of Aboriginal people, such as peace. Harding (2005) found this to still be true in the media's representations up to and including reports from 2002. The media is very prevalent in North American society and when certain biases are presented repeatedly it is no wonder that these common stereotypes persist.

Personality traits, such as conformity (Pettigrew, 1958) may also be important factors in stereotype maintenance. For example, researchers suggest that if a stereotype has more 'gossip' value then it is more likely to be perpetuated (Schaller, Conway, & Tanchuk, 2002). When hearing the highly talked about stereotypes, people who are high in conformity will likely adopt the stereotypes as their own. Similarly, those high in conformity will be more likely to conform to their in-group more than those who are characterized by low levels of conformity, and accept any out-group intolerances (Pettigrew, 1958).

Lastly, exposure to out-group members may influence stereotype maintenance. For example, researchers have found that persistence of negative stereotypes relates to how common a racial group is in the population (i.e., more negative stereotypes exist for less common racial groups). Schaller, Conway, & Tanchuk (2002), for instance, conducted research in Vancouver, British Columbia where Chinese are a highly represented race in the population and First Nations are less represented. They found that fewer stereotypes existed for Chinese, and they tended to

be more positive when compared to stereotypes about First Nations people. The reason that population representation influences stereotypes may be because of the amount of contact people have with that racial group. In support of this idea, researchers have found that children who attended a diverse school were less likely to display a racial bias when assessing various actions performed by Black or White individuals, whereas those who attended a racially homogenous school displayed more racial bias (McGlothin & Killen, 2006). Other research has reported similar findings (McClelland & Linnander, 2006).

Stereotypes and Perception

Stereotypes are not necessarily dangerous until they influence perception and behaviour. Unfortunately, stereotypes have often been shown to have such an effect on perception because they tend to lead to expectancies. For example, in a classic study by Duncan (1976), participants watched a videotape of one actor shoving another actor with race being the manipulated variable. What Duncan found was that White participants were significantly more likely to judge the shove as aggressive when it was performed by a Black individual compared to when it was performed by a White individual. This study was replicated with a younger, racially mixed sample of participants by Sagar and Schofield (1980). These researchers found that sixth grade children tended to perceive ambiguously aggressive actions by Black individuals as being meaner and more threatening than the same actions performed by White individuals. What was even more interesting was that the researchers found that the same bias was held for both Black and White participants demonstrating that racial stereotypes can influence an individual's perception of their own in-group. Similar, more recent studies, confirm these sorts of results (e.g., Rudman, Feinberg, & Fairchild, 2002).

Another common type of study that examines stereotypes and perception are mock jury studies. Many jury studies have provided support for the role of race in determining a verdict. For example, Bodenhausen (1988) found that Black defendants were deemed guilty more often than White defendants and tended to receive harsher punishments by mock jurors even when cases were identical beyond the defendant's race. A similar, more recent study conducted by Sommers and Ellsworth (2001) found that when White mock jurors were presented with a Black suspect and a White victim for a non-race salient trial the participants were more likely to convict the suspect and be more confident in their verdicts compared to when they were presented with information for a White suspect and Black victim even though every other aspect of the cases were identical. Interestingly, when mock jurors were presented with a trial where race was made salient the bias did not appear, as though they were correcting to appear non-prejudicial. Mock jury studies in Canada have been less clear with respect to the impact of defendant race. Schuller, Kazoleas, and Kawakami (2009) found that Canadian jury members were more likely to deliver a guilty verdict to Black defendants. However, other Canadian researchers (e.g., Bagby, Parker, Rector, & Kalemba, 1994; Lant, Clow, & Cutler, 2011) have failed to replicate this and found no racial bias in jury member's decisions, suggesting that stereotypes may differ in Canada.

The weapon identification task is another commonly used task to detect the influence of race on perception. Building on the stereotype that Black individuals are more dangerous than White individuals (Devine & Elliot, 1995), Payne (2001) examined a task that required participants to distinguish between images of weapons and non-weapons when primed with images of either Black or White faces. Results of this study showed significant differences in participant's response times, such that participants identified guns faster when they were primed

with a Black target compared to a White target. In addition, under conditions where participants were forced to respond quickly, they were more likely to falsely identify the object as being a weapon (instead of a neutral object) when the prime was a Black target compared to a White target. Presumably these results emerged because people possess stereotypes of Black individuals as being more dangerous, violent, or crime-prone compared to Whites, and therefore expect to see a weapon.

All of the previously cited research has focused on how racial stereotypes about Black individuals influence perceptions of their actions. There is, however, similar research that has examined other racial groups. For instance, Horry and Wright (2009) examined the stereotype that Middle Eastern men may be associated with acts of terrorism. Participants were primed with words associated with terrorism (e.g., bomb) and were asked to perform a dot-probe task. Specifically, participants fixated their attention on a computer screen, were primed with a word related to terrorism or not, followed by two faces on opposite sides of the screen, one White and one Middle Eastern. Then a dot was presented on either side of the screen, and participants had to indicate which side the dot was on. The researchers expected that participants would more quickly identify the location of the dot if it was presented on the same side as the Middle Eastern face following a terrorism prime. Results of this study did reveal that when primed with a terrorism related word anxious participants attended more to the side where the Middle Eastern face was presented and therefore more rapidly identified the location of the dot when it was on the same side.

Stereotypes and Shooting Behaviour

The previously cited studies demonstrate that the activation of stereotypes can have a strong influence on peoples' perception of information. Similarly, other studies have found that

the impact of stereotypes can go beyond perception and influence actual behaviours. A variety of behaviours have been examined (e.g., hiring behaviours; Orpen, 1982), but the one that is of most relevance to the current thesis is shooting behaviour (e.g., Correll et al., 2002; Correll, Park, Judd, & Wittenbrink, 2007; Correll et al., 2007a).

Correll et al. (2002) were the first to examine this issue. These researchers presented student participants (via desktop computer simulation) with an image of a Black or White target holding either a non-threatening (e.g., cell phone) or threatening (e.g., gun) object. Using different keys on their keyboard, participants were instructed to shoot all armed targets, but refrain from shooting unarmed targets, with all decisions being required within a very short response window (630ms). The researchers analyzed various signal detection indices (d' , or sensitivity and c , or response bias) in addition to reaction times and errors.

The results of the study showed that target race had no impact on the participants ability to discriminate between armed and unarmed targets (i.e., d' did not vary significantly as a function of target race). However, response bias, or one's willingness to make a shoot decision, did vary as a function of target race, with participants being significantly more willing to shoot Black targets compared to White targets (i.e., c was significantly lower for Black targets). When examining reaction time, there was a significant object by race interaction, such that participants had a significantly faster reaction time on stereotype-congruent trials (i.e., shooting at armed Black targets and not shooting at unarmed White targets). The results from the error rates analysis also revealed a significant object by race interaction, a negative Black bias, such that unarmed Black targets were incorrectly shot more often than unarmed White targets. Similar results have been reported by Correll and his group in follow-up studies using community members and students (Correll et al., 2007a; Correll, et al., 2007b; Ma & Correll, 2011).

However, when Correll et al. (2007a) used police officers as participants the results were not as consistent. For these participants, a racial bias was only observed through reaction times, such that participants were quicker when shooting at a stereotype-congruent target (e.g., Black armed and White unarmed). In addition to the shooting task, the researchers examined if various measures were related to the observed shooting bias, including a measure of explicit racism and a measure that examined participant's motivation to control prejudice reactions. Interestingly, no relationships were found between these measures and racial bias on the shooting task.

Other researchers have also found a strong racial effect in shooting studies when Black and White targets have been examined. For example, Plant, Peruche, and Butz (2005) presented non-Black student participants with an image of either a Black or White face with a threatening or non-threatening item superimposed on the targets forehead. Similar to the instructions provided in Correll et al.'s (2002) study, participants were told to shoot (by pressing one key) when they saw a threatening item or not shoot (by pressing a different key) when they saw a non-threatening item. Results confirmed that participants were more likely to make errors on stereotype-incongruent trials (Black/non-threatening object and White/threatening object). These results were replicated in an American police officer sample by Plante and Peruche (2005).

Recently, Plant, Goplen, and Kunstman (2011) have examined the influence of race *and* gender on shooting decisions. The results of their first study demonstrated a shooting bias towards men. Participants set a lower threshold to shoot men compared to women and were more likely to shoot unarmed men compared to unarmed women. Additionally, participants were quicker to shoot in stereotype-congruent pairings (e.g., armed men) compared to incongruent pairings (e.g., armed women). The second study reported in this paper found that shooting decisions were influenced by both race and gender. More specially, participants tended to

mistakenly shoot unarmed Black male targets more than all other unarmed targets (Black females, White females, and White males). Similarly, lower thresholds were set for Black males compared to the other groups.

Continuing in the effort to understand Black-White biases in shooting decisions, Kenworthy, Barden, Diamond, and del Carmen (2011) took a new perspective by examining White participants' in-group membership and their feelings about their in-group. This is different from previous shooting studies that have focused on participant's feelings towards out-group members using various explicit measures of racism. These researchers examined in-group feelings and related these feeling to shooting decisions involving both Black and White targets. Using signal detection analysis to examine their results they found that c varied significantly as a function of in-group identification, such that those participants who were higher on an in-group identification questionnaire exhibited a larger shoot-bias (i.e., a lower c) when encountering Black targets.

While published research of the sort just described is still somewhat lacking in Canada, more and more attention is being paid to these issues. Interestingly, the results from studies conducted in the U.S. that relate to Black and White targets do not always appear in a Canadian context. For example, in 2009, Yoshida wrote a dissertation using a similar shooting task to that used by Correll et al. (2002) and did find evidence for a Black bias in reaction times when making shoot decisions (armed Black targets were shot quicker than armed White targets), but he did not find the equivalent bias for don't shoot decisions. Other Canadian research has failed to find any evidence of a Black bias. In fact, across multiple studies, Bennell and Taylor (2010) found evidence for a reasonably strong White bias, suggesting that Canadians may not have the same negative Black stereotypes as Americans, or that Canadians may not identify with their in-

group as much as those in the United States. Alternatively, Bennell and Taylor's results could potentially be explained by the fact that participants knew that the task was assessing their racial stereotypes and they responded in a socially desirable way (i.e., overcompensated for their Black biases).

The Importance of Including Multiple Racial Groups in Simulated Shooting Studies

Recently, research has begun to look at the simulated shooting task involving multiple races. Sadler, Correll, Park, and Judd (2012), for example, examined American college-aged participant's and police officer's shooting biases for White, Black, Asian, and Latin targets. The researchers analyzed reaction times and the signal detection index d' . A Black bias was the only reaction time bias found in students (i.e., they responded faster to Black armed targets compared to Black unarmed targets). Officers, on the other hand, displayed a significant response time bias towards Black targets relative to all other races, Latinos relative to Asians and Whites, and Whites relative to Asian; in other words, when examining reaction times of officers there were significant differences in the interactions between race and object between these pairings. Findings for d' showed that sensitivity was higher for Blacks and Latinos than toward Whites and Asians, indicating that officers could discriminate armed from unarmed targets to a higher degree when the targets were Black or Latino. Although this research does provide insight into a multiracial shooting context it still uses an all American sample.

The need to extend shooting research in Canada beyond the typical examination of Black and White targets cannot be overstated. Indeed, Canada is known as a multicultural and racially diverse nation with approximately 16% of the Canadian population reporting being a visible minority (Statistics Canada, 2010a). All of the individuals belonging to these racial groups can come into contact with the law in use-of-force encounters and thus there is the potential for racial

stereotypes to factor into the decisions made by police officers. Indeed, available data suggests that some of the racial groups that will be examined in this study frequently come into contact with police officers in Canada (Wortley, 1996), and although Canada is a multicultural nation it is unlikely to be free from the stereotypes or biases that might negatively impact shooting decisions.

Indeed, when researchers have reviewed multicultural and ethnic attitudes in Canada the findings are clear; there is a strong preference for European immigrants over those of non-European origin (Berry & Kalin, 1995). Specifically, in a national survey conducted in 1991, participants were asked to report their comfort levels when associating with different ethnic groups. In order, the level of comfort reported was as follows: British, French, Italians, Ukrainians, Germans, Jews, Portuguese, Chinese, Native Indians, Blacks, Arabs, Muslims, Indo-Pakistanis, and Sikhs. From this order it is clear that people tended to be more comfortable associating with those who are White compared to those who are not White. What is not yet clear is whether these groups are associated with the danger stereotypes that might impact the shooting decisions made by police officers.

More recent research conducted by Berry (2006) has revealed that overall attitudes towards racial groups have remained fairly constant. Participants rated that they were most comfortable around European individuals (both immigrants and not) compared to Chinese, Aboriginals, Blacks, Arabs, Muslims, Indo-Pakistanis and Sikh groups. The research does suggest that participants were less comfortable around immigrants compared to members of the racial groups that were born in Canada, but overall, participants are still less comfortable with visible minorities (non-European) than those of European descent.

One particularly important group to include in Canadian studies of shooting bias, given their status in the Canadian context, are Aboriginal people. As discussed previously there are many negative stereotypes surrounding Aboriginals (e.g., angry warriors; Harding, 2005). Because of this, Harmer et al. (2011) used Correll et al.'s (2002) shooting task to examine whether Aboriginal biases exist in shooting decisions. Signal detection analyses revealed that participants set a lower criterion (c) for Aboriginal targets compared to White targets (i.e., exhibited a shoot bias towards Aboriginals). Similarly, there was a significant interaction between race and object for response times, such that participants made correct decisions more quickly on stereotype-congruent trials (e.g., armed Aboriginal targets) compared to stereotype-incongruent trials (e.g., armed White target).

Another group of Canadians that have faced a lot of prejudice in recent years are those of Middle Eastern descent. Middle Easterners make up approximately 5% of the Canadian population (Statistics Canada, 2010a). As discussed earlier, Berry and Kalin (1995) found that Middle Eastern groups (Arabs, Muslims, Indo-Pakistanis, and Sikhs) were rated with the lowest level of comfort by Canadian participants. Similarly, Horry and Wright (2008) found that many of their participants exhibited a strong association between Middle Easterners and terrorism. Although this study was not conducted in Canada it did reveal a terrorism stereotype of Middle Easterners. Such a stereotype (or related ones, such as the likelihood of Middle Easterners to be criminal), could conceivably lead to problems in use of force encounters.

Given the large number of Asians who currently call Canada home (6% of all Canadians; Statistics Canada, 2010a), they are also an important group to include in the current study. Surprisingly, little research has been conducted on stereotypes surrounding East Asians, and no shooting studies have ever included this group as one of the targets. Chinese (an East Asian

group) were included in the research by Berry and Kalin (1995) and they were found to be rated lower than Europeans in terms of the comfort level of Canadians, but higher than Aboriginals, Blacks, and those of Middle Eastern descent. Also in contrast to Aboriginals, Blacks, and those from the Middle East, the small amount of research that has examined stereotypes associated with East Asians tends to find they are associated with positive rather than negative stereotypes (e.g., they are characterized by qualities such as being ambitious and intelligent; Schaller et al., 2002). These stereotypes are of course very different from those that emerge from the research discussed above (e.g., Blacks as aggressive, Aboriginals as 'angry warriors', and Middle Easterners as terrorists). Essentially, East Asian targets will be used in the current study for two main reasons. First, they are a prominent racial group in Canada who might come into contact with the law and given this, it is important to find out what sorts of stereotypes exist for this group and to determine if those stereotypes relate to shooting decisions (even positive stereotypes can result in biased and consequential decisions, such as not shooting a target who is in fact armed). Second, in order to conceal the nature of the study it is important to include targets from as many races as practically possible.

Finally, while Canadian research may not produce results that are as clear cut as those found in American research when it comes to Black racial stereotypes, previous stereotype and shooting studies clearly warrant this racial group being included in the current study. As previously discussed, this is the group that has been examined most extensively in both stereotype research and shooting research, and barring the recent exceptions discussed above

(i.e., Bennell & Taylor, 2011), findings of negative bias permeate the literature. Given the fact that participants may have been responding in a socially desirable manner in the recent research conducted by Bennell and Taylor because they were aware of the study's purpose², there is still value in including Blacks in the current study to determine if the previously reported findings will replicate in this study (where a greater attempt will be made to conceal the purpose of the study).

Summary

Research has demonstrated the importance of stereotypes in influencing perceptions as well as behaviour. Shooting behaviour in particular has been found to be influenced by racial stereotypes. Previous research has focused solely on White and non-White targets. Such a study does not take account of the various racial groups that exist within Canada who can come into contact with the law during use-of-force encounters. The current study used the same sort of shooting task used in previous studies, but examined multiple races simultaneously to see how racial biases vary across different groups. In addition to examining the sorts of biases that exist in the shooting decisions of participants and how these biases relate to explicit racial stereotypes, this research also focused on both in-group and out-group biases to see how they relate to shooting behaviour (see below).

The Current Study

Using a simulated shooting task, the current study examined racial biases in shooting decisions using targets from multiple racial groups. The study also examined how an explicit

² Research beyond Bennell and Taylor (2011) has clearly indicated that people do try to conceal their prejudicial thoughts (e.g., Devine, Plant, Amodio, Harmon-Jones, & Vance, 2002) and that this can lead to skewed findings.

racism measure, an in-group identification measure, and various demographic variables correlated with performance on the simulated shooting task.

Hypotheses

No past Canadian research has examined shooting decisions across a large number of racial groups, so this research will be largely exploratory in nature. However, certain tentative hypotheses are described below.

- 1) It is expected that for racial groups who are stereotyped as being dangerous (by previous research; i.e., Blacks and Middle Easterners) participants will set lower thresholds for making shooting decisions (c). Based on previous research, it seems unlikely that any significant differences will be observed for d' across the various races.
- 2) With regards to errors and reaction times for correct decisions, it is expected that a race by object interaction will be present. That is, errors are expected to occur more often (and reaction times will be longer) when participants encounter stereotype-incongruent pairings (e.g., a dangerous race, such as Blacks and Middle Easterners that is not armed) compared to the stereotype-congruent pairings (e.g., a dangerous race that is armed). Again, dangerous groups are being determined here based on previous research.
- 3) It is expected that individuals with high explicit racial stereotype scores will display more racial bias on the shooting task (based on c , d' , errors, and reaction times) for those groups that are stereotyped against. However, one's motivation to control their prejudiced reactions, as measured by the MCPR, will moderate the relationship between explicit stereotype scores and shooting bias (i.e., significant positive correlations will exist between stereotype scores and shooting bias, but only for those individuals scoring low on the MCPR).

- 4) Based on research conducted by Kenworthy, Barden, Diamond, and del Carmen (2011) it is also expected that individuals who exhibit a high in-group identification score will display more racial bias on the shooting task (based on biased indices) against all groups other than their own.

Method

Pilot Work

In order to conduct the main study, it was first necessary to carry out pilot work. There were two parts to the pilot work. First, the images for use in the shooting simulations needed to be developed and validated. Second, adjectives that will be used in the explicit stereotype measure needed to be selected and validated to ensure that they are associated with 'safeness' and 'dangerousness' (see below for more details).

Participants for Image Development.

Similar to previous shooting tasks, models were photographed in various positions while holding various items for use in the main study (e.g., Correll et al., 2002). Stimuli had already been developed for three of the races that were to be used in this study (White, Black, and Aboriginal). Therefore, the sample for the pilot work consisted of eight models, four for each of the two remaining target groups (East Asian and Middle Eastern). The models were recruited from the Carleton University campus. Researchers approached students on campus and requested their participation in exchange for \$10.

Procedure for Image Development.

Once models agreed to participate they were brought to the Police Research Lab (HCI-6113) where they were asked to sign an informed consent form (see Appendix A). The photographer instructed participants to pose in five different stances (e.g., kneeling with left leg

forward) while holding four different objects (a black mock handgun, a silver mock handgun, a silver cell phone, and a black wallet). For each pose with each object two photos were taken to ensure that there was at least one usable photo. This means every model had 40 photos taken (4 items x 5 poses x 2 photos each). All photos were taken in the Police Research Lab against a white wall using a Sony Cyber-shot digital camera. Once all photos had been taken, participants were paid and given a debriefing form (See Appendix B). Eighty photos were selected in total, sixteen from each race, ensuring that images were counterbalanced for weapon type and foot position. These 80 photos were then superimposed onto different backgrounds using Adobe Photoshop. The backgrounds were of various indoor and outdoor settings (e.g., by the river, in an office, etc.) and already exist from previous research. Please see Appendix C for examples of stimuli.

Manipulation Check of Images and Adjectives.

A manipulation check was conducted to ensure that the images that were developed are suitable for the main study. The check was done to verify that participants could correctly identify each suspect's race. Additionally, to ensure that the adjectives used in the adjective checklist (i.e., explicit stereotype measure) in the main study are in fact associated with notions of 'safe' and 'dangerous' participants also rated the degree to which they thought a large number of adjectives were representative of 'safe' or 'dangerous'. See Appendix D for an example of the manipulation check survey.

Participants for Manipulation Check.

An independent sample of 34 undergraduate students was involved in the manipulation check. Participants were recruited using the SONA system (see Appendix E for a copy of the recruitment announcement) and were provided with course credit for their participation. The

majority of participants were female ($n = 21$) and the participants had a mean age of 20.18 years old ($SD = 2.39$).

Procedure for Manipulation Check.

After participants signed up for the study via SONA they were provided with a link to a survey, which was created using SurveyMonkey. Participants were presented with an informed consent form that detailed the study and their rights (see Appendix F). Half of the participants ($n = 17$) were shown the adjective verification section first followed by the manipulation check of the images; the other half ($n = 17$) were presented with the images check followed by the adjective verification. Following the completion of the survey, participants were thanked for their participation and debriefed (See Appendix G).

The adjectives presented to participants were found using online dictionaries and thesauruses. The goal was to create a fairly extensive list of words related to safe or dangerous individuals. Forty words with high face validity were finally selected for presentation to these participants for the purpose of verifying the extent to which each word was viewed as safe or dangerous. The list of 40 words was randomized and presented to participants. Participants were asked to rank each word on a scale from 1 to 10 with 1 being safe, 5 being neither safe nor dangerous, and 10 being dangerous. Participant data was downloaded from SurveyMonkey and analyzed in SPSS. The words that were rated highest had the greatest association with 'dangerous' and the words rated lowest had the greatest association with 'safe'. From the list of 40 words the top 10 dangerous words (highest rated) and top 10 safe words (lowest rated) were selected for use in the main study. Table 1 presents the selected words, their means and standard deviations.

Table 1

Means and Standard Deviations for the 10 most safe and 10 most dangerous adjectives.

Word	Mean	Standard Deviation
Safe Words		
Safe	1.32	1.01
Gentle	1.71	.80
Loving	1.94	1.59
Friendly	2.03	1.31
Considerate	2.06	1.03
Comforting	2.15	1.58
Kind	2.21	1.92
Trustworthy	2.24	1.94
Sympathetic	2.28	1.30
Nice	2.30	1.40
Dangerous Words		
Killer	9.39	1.92
Attacker	9.29	1.66
Dangerous	9.26	1.75
Violent	9.06	1.65
Criminal	8.97	1.66
Evil	8.82	2.12
Cruel	8.68	1.75
Vicious	8.62	1.81

Brutal	8.53	1.88
Bully	8.18	1.68

In addition to the adjectives, participants were also presented with the 80 images that were developed for the study and were asked to identify what racial/ethnic group they believed the individual belongs to. To do this, participants were presented with a list of possible racial/ethnic groups as well as options for ‘don’t know’ and ‘other’. Analyses were conducted to ensure that participants were able to correctly identify each target’s race. Table 2 presents the results for each target, displaying the percentage of correct identifications for each model.

Table 2

Percent of Participants Who Correctly Identified Model's Races Sorted by Race

Race	% Correct
Aboriginal	
Model 1	41.2
Model 2	70.6
Model 3	67.6
Model 4	67.6
Asian	
Model 1	97.1
Model 2	97.1
Model 3	90.9
Model 4	94.1
Black	
Model 1	91.2
Model 2	94.1
Model 3	97.1
Model 4	97.1
Middle Eastern	
Model 1	97.1
Model 2	88.2
Model 3	100
Model 4	79.4

White	
Model 1	88.2
Model 2	97.1
Model 3	97.0
Model 4	97.1

For Asian, Black, Middle Eastern and White targets, participants did very well in identifying the target race with all models (except Middle Eastern model 4) having greater than 80% correct identification. However, the results for Aboriginal models were much less accurate. Indeed, participants were clearly not able to determine the race of the Aboriginal targets accurately. Due to the results obtained in this manipulation check all Aboriginal models were excluded from the remainder of the study.³ Without being able to correctly identify the target race it makes it difficult to interpret the underlying mechanisms of a shooting bias if one is found (i.e., if Aboriginal biases existed in shooting decisions, it would not be possible to conclude that a negative Aboriginal stereotype was causing this bias, given that participants may not be perceiving the stimuli as Aboriginal targets).

³ Often in cases like this, further attempts would be made to gather and then test additional stimuli. This was not done in the case of Aboriginal models for three reasons. First, it was very difficult to get the Aboriginal models included in the original images and the researchers felt that it would be very difficult to identify additional Aboriginal models for a second round of manipulation checks. Second, the Aboriginal models used in the original images were deemed to be highly stereotypical (in terms of their appearance) and it seemed unlikely that different results would be obtained with a second set of images. Third, due to the relatively low Aboriginal population on the Carleton campus (and around Ottawa more generally) it was believed that identifying Aboriginals correctly might prove difficult for participants given that exposure to this group of individuals will be relatively rare and research suggests that infrequent exposure makes it more difficult to correctly identify the race of a given model (Sporer, 2001).

Main Study Participants.

Ninety-one undergraduate students from Carleton University participated in the main study (two participants had to be removed for reasons discussed later). Students signed up for the study through the SONA system and were granted credits towards certain courses for their participation (see Appendix H for a copy of the recruitment announcement). Additionally, participants had the opportunity to win a monetary award based on their performance on the shooting task (the participant who had the highest accuracy score received \$250, the second place participant received \$100, and the third place received \$50).

Of the 89 participants, the majority was male (47)⁴. The mean age of participants was 20.16 ($SD = 4.27$) and the majority of participants (84) had no prior police experience. More than half of the participants are White (50), 7 participants are Black, 10 are East Asian, 5 are Middle Eastern, 4 are South Asian, 1 is Aboriginal, 11 participants identified as 'other', and 1 selected 'prefer not to answer'.

Measures

Shooting task. The experimental task was based on the task used by Correll et al. (2002), which involved participants making shoot or don't shoot decisions on computerized lethal force simulations. Participants were presented with images of armed and unarmed targets that varied by race on a desktop computer using E-prime software (version 2.0). Participants were instructed to shoot the armed targets they saw by pressing a key designated as the "shoot" key and to not

⁴ Independent sample t-tests conducted on the various shooting measures revealed no significant differences across gender so further analyses analyzed the sample as a whole. Additionally, no significant differences were examined for Police Experience, or participant age.

shoot targets who were unarmed by pressing a key designated the “don’t shoot” key. The task consisted of 8 practice trials and 128 test trials. Decisions and reaction times for each decision were recorded by the E-prime software.

In each trial a random number of background scenes (0-3) were presented for a random amount of time (500-800ms). Following this an additional background image was presented, again for a random period of time, until a target appeared at a random location on the screen. The 16 models appeared in four different images, one with each of the objects (i.e., silver gun, black gun, silver cell phone, black wallet) that were each presented twice. All target images were counterbalanced to ensure that all backgrounds, foot positions, and object positions were presented equally across races. Participants had 630ms from the time of target exposure to make their decision or else the trial timed out. Previous research (e.g., Correll et al., 2007b) has also used this time as it is believed to be a short enough timeframe to examine automatic responses.

Following each trial, participants received feedback based on their decision. The feedback was similar to Correll et al.’s (2007a) feedback where a hit (correctly shooting an armed target) earned participants 10 points, a correct rejection (not shooting a target holding a non-dangerous item) earned 5 points, a false alarm (shooting a target holding a non-dangerous item) cost participants 20 points, and a miss (not shooting a target an armed target) resulted in participants losing 40 points. Participants who let the 630ms elapse with no response suffered a ‘timed out’ penalty of 10 points. A summary screen, which indicated the total points earned in the shooting task, was presented to each participant at the end of all the trials. The point system was used to motivate participants to perform well as the highest scorers received financial rewards.

Explicit stereotype measure. The explicit stereotype measure consisted of four modified forms of Devine and Elliot's (1995) adjective checklist. This measure assessed participants' perception of cultural stereotypes, as well as their own personal stereotypes, for each of the different racial groups included in the current study. Participants were presented with 20 adjectives that were assessed in the pilot study (10 associated with 'safe' individuals and 10 associated with 'dangerous' individuals). They were asked to indicate which adjectives they believed represented their personal views of a certain racial group. Participants were also asked to select all the adjectives that they feel represent cultural stereotypes of the four racial groups. For each of the measures (e.g., Asian cultural, Asian personal etc.), a stereotype score was derived for each participant by calculating the total number of dangerous stereotypes they selected. The safe-associated words were used as distracter items in an attempt to limit socially desirable responding. Kuder-Richardson 20 values computed for all 8 measures used in the current study revealed good reliability (Asian cultural = .80, Asian personal = .88, Black cultural = .86, Black personal = .84, Middle Eastern cultural = .91, Middle Eastern personal = .93, White cultural = .85, and White personal = .87). See Appendix I for a copy of the 20 adjectives presented to participants.

Motivation to control prejudiced reactions scale. Participants also completed the Motivation to Control Prejudiced Reactions (MCPRS) scale (Dunton & Fazio, 1997). This 17-item scale measures participant's concern with controlling their prejudice. There are two factors that the MCPR examines: external and internal control. External control is a concern with acting prejudiced or being perceived as prejudiced by those around us (e.g., "It is important to me that other people not think I'm prejudiced"). Internal control, on the other hand, is a concern for not acting prejudiced due to one's own thoughts and perceptions of oneself (e.g., "I get angry with

myself when I have a thought or feeling that might be considered prejudiced”). Participants were asked to rate their level of agreement with each item on a 5-point scale. Item scores were summed with higher scores on the scale indicating that the participant is more motivated to control their prejudiced reactions. This measure has strong psychometric properties. For example, Dunton and Fazio (1997) found that across four independent samples, the alpha coefficients ranged from .74 - .81. In this study, the overall measure was also found to be reliable ($\alpha = .81$) and the subscales also had respectable levels of reliability, although the external subscale was found to be more reliable than the internal subscale (external subscale $\alpha = .77$, internal subscale $\alpha = .65$) Appendix J provides a copy of this scale.

In-group identification. Participants were additionally asked to complete an in-group identification questionnaire using items from Kenworthy, Barden, Diamond, and del Carmen (2011). This questionnaire assesses the degree to which participants identify with their racial in-group. The questions ask participants to indicate how much they agree with nine different statements on Likert-scales from 1-7 (e.g., Being a member of my race/ethnicity is an important reflection of who I am). An overall score was calculated for each participant by summing all of the item scores. A higher score indicates a greater sense of identification with racial in-groups. Kenworthy et al. (2011) found the reliability of this scale to be excellent ($\alpha = .94$) and a similarly strong reliability score was found in this study ($\alpha = .92$). See Appendix K for a copy of the questions used.

Demographic questionnaire. Participants were also asked to complete a demographic questionnaire. The purpose of the questionnaire was to gain information on the participant’s age, gender, ethnicity, and experience with police work. See Appendix L for a copy of the questionnaire.

Procedure

Participants completed the task and questionnaires individually in the Police Research Lab at Carleton University using a desktop computer. The shooting task, as well as the other measures, were administered using the E-prime software package (Psychology Software Tools, 2009). First, participants filled out the informed consent form (see Appendix M). Then, participants were provided with instructions on the computer for the shooting task. Using E-Prime, each participant completed 8 practice and 128 test trials of this task. Once the shooting task was complete each participant filled out the various measures described above (the explicit stereotype measure, the MCPRS, the in-group identification questionnaire, and the demographic questionnaire). With the exception of the demographic questionnaire, which was always presented last, the other measures were presented in random order across participants to control for any order effects. Following completion of the demographic questionnaire, participants were presented with debriefing information and thanked for their participation (Appendix N).

Results

Preliminary Data Screening

A preliminary data screening was conducted on all raw data. Shooting data (errors and reaction times), the in-group identification questionnaire, the adjective checklist, and the MCPRS were examined for missing data, outliers, and normality.

Missing Data.

Shooting data. Due to the nature of the program (E-Prime) participants were not presented with another trial until the previous trial was complete, therefore there was no missing data for the shooting task.

In-group identification, adjective checklists, MCPRS, and demographic information.

All questions were presented one at a time and participants had to respond to a question in order to move on to the next question. Therefore, there was no missing data for any of these measures.

Outliers.

Shooting data. Multiple outliers were found in the response time data (determined by having a z-score +/- 3.29). Two participants were found to be outliers (extremely quick reaction times) in three or more of the eight different target pairings and were therefore removed from further analyses as they were likely guessing. Another three participants were outliers, but only in one of the target pairings and therefore their unaltered data was retained.

A total of 5 outliers (determined by having a z-score +/- 3.29) were present in the error data. Each of these values was replaced with a value one standard deviation higher than the next most extreme score in the distribution (Tabachnick & Fidell, 2007).

Timeouts were also examined. The total number of timeouts for an individual participant ranged from 0 to 36, with the mean across the 128 trials being 12.27 ($SD = 7.07$). This is fairly consistent with previous findings (e.g., Correll et al., 2007).

In-group identification, adjective checklists, MCPRS, and demographic information.

Outliers were only found in the adjective checklist measure. Specifically, there was one individual who was an outlier (more than three standard deviations above the mean) for the Asian cultural measure, meaning they had selected significantly more *negative* adjectives (compared to others) to represent what they believe to be the cultural stereotypes of Asians. Furthermore, three outliers (above average) were found for the Asian personal measure and two for the Black personal measure. The data was unaltered as the researchers decided it was meaningful if a person was an outlier on these measures.

Normality.

Shooting data. An examination of the grouped error data and reaction time data revealed that both variables were skewed. Reaction time data revealed a moderate negative skew (-.61), and the Shapiro-Wilk (S-W) test confirmed it to be a significant negative skew ($p = .04$). Consistent with Correll et al. (2002), a log transformation was applied to the grouped reaction time data, but this actually made the skewness worse and in a positive direction (.25, $p = .005$). The examination of error data revealed a positive skew (1.02) and the S-W test confirmed it to be significant ($p < .001$). Again, a log transformation was applied to the data, but this did little to correct the skewness (.86, $p < .001$). Since the log transformations did little to remedy the skewness of the data the reaction times and errors were analyzed in their original form.

Main Analyses**Signal Detection**

Correct and incorrect responses were used to calculate the signal detection indices. Timeouts were not included in this analysis. The criterion estimate (c) reflects the threshold participants adopt to make shoot decisions and the sensitivity estimate (d') reflects the ability of participants to differentiate between armed and unarmed targets. Both of these estimates were calculated for each racial group separately and then the data was subject to a one-way ANOVA with race as a between subject factor. Data for c and d' are presented in Table 3.

Table 3

Response Criterion and Sensitivity Across Races

Signal Detection	Asian Targets		Black Targets		Middle Eastern Targets		White Targets	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Criterion (<i>c</i>)	.07	.30	-.09	.29	-.05	.27	-.11	.24
Sensitivity (<i>d'</i>)	2.29	.82	2.09	.83	2.03	.93	2.48	.88

Criterion analysis. Having a criterion (*c*) of 0 indicates no bias towards shooting or not shooting. Positive *c* values indicate a bias to not shoot whereas negative *c* values indicate a bias to shoot. An ANOVA revealed a significant main effect of race, $F(1, 88) = 8.93, p < .001, \eta^2 = .09$. Post-hoc analyses were conducted on all possible pairwise comparisons.

Asian vs. Black, Middle Eastern and White Targets. Significant differences existed across all comparisons involving Asian targets, such that *c* values were significantly higher for Asian targets ($M = .07, SD = .30$) compared to Black ($M = -.09, SD = .29$), Middle Eastern ($M = -.05, SD = .27$) and White targets ($M = -.11, SD = .24$). It should be noted that Asian targets were the only racial group that had an average *c* value greater than 0, representing a tendency to not shoot.

Black vs. Middle Eastern and White Targets. No significant differences in *c* values were found between Black targets and the other targets.

Middle Eastern vs. White Targets. There was no significant difference in *c* values between Middle Eastern and White targets.

In addition to the ANOVA, multiple one-sample t-tests were conducted to examine if the *c* for any group was significantly different from 0. Results revealed that *c* was significantly less than 0 for both Black, $t(88) = -2.85, p = .005, 95\% \text{ CI } [-.15, -.03]$, and White targets, $t(88) = -$

4.23, $p < .001$, 95% CI [-.16, -.06], indicating a tendency to shoot. The c value for Asian targets was significantly greater than 0, $t(88) = 2.36$, $p = .02$, 95% CI [.01, .14], indicating a tendency to not shoot.

Sensitivity analysis. A higher value of d' is indicative of a greater ability to differentiate between armed and unarmed targets. The one-way ANOVA comparing d' across races revealed a significant main effect of race, $F(1,88) = 12.201$, $p < .001$, $\eta^2 = .12$. Post-hoc analyses were conducted on all possible pairwise comparisons.

Asian vs. Black, Middle Eastern and White Targets. The only significant difference when comparing Asian targets to other targets was that the d' score was larger for Asians ($M = 2.29$) compared to Middle Eastern targets ($M = 2.03$).

Black vs. Middle Eastern and White Targets. Post-hoc analyses revealed one significant pairwise comparison, such that d' values for Black targets ($M = 2.09$) were lower than for White targets ($M = 2.48$).

Middle Eastern vs. White Targets. Average d' scores were significantly lower for Middle ($M = 2.03$) Eastern targets compared to White targets ($M = 2.48$).

Reaction Time.

The reaction time data was analyzed by examining the time it took participants to make correct decisions. To analyze the reaction times, a mean score was derived for each participant for the following: Asian armed targets, Asian unarmed targets, Black armed targets, Black unarmed targets, Middle Eastern armed targets, Middle Eastern unarmed targets, White armed targets, and White unarmed targets. Those means were then submitted to a 4 (Race: Asian vs. Black vs. Middle Eastern vs. White) x 2 (Armed vs. Unarmed) repeated measures ANOVA. The data are provided in Table 4.

Table 4

Reaction Time Means and Standard Deviations for Correct Shooting Decisions Across Races and Objects

Target Race	Armed Target		Unarmed Target		Average Across Objects	
	<i>M (ms)</i>	<i>SD</i>	<i>M (ms)</i>	<i>SD</i>	<i>M (ms)</i>	<i>SD</i>
Asian	468.62	32.00	510.17	36.51	489.39	29.05
Black	477.30	34.60	514.48	31.82	495.89	28.58
Middle Eastern	467.01	33.22	508.55	34.40	487.78	30.43
White	456.39	30.34	503.00	31.56	479.69	27.36
Average Across Races	467.33	28.69	509.05	28.92		

A significant main effect was found for object, $F(1,88) = 294.32, p < .001, \eta^2 = .77$, such that participants were faster to shoot at armed targets ($M = 467.33, SD = 28.69$) than to not shoot at unarmed targets ($M = 509.05, SD = 28.92$). There was also a significant main effect found for target race, $F(3,264) = 21.79, p < .001, \eta^2 = .20$. Post-hoc pairwise comparisons were conducted. Holding object constant, participants responded faster to Asian targets ($M = 489.38, SD = 29.05$) than Black Targets ($M = 495.89, SD = 28.58$). However, participants responded slower to Asian targets ($M = 489.38, SD = 29.05$) than White Targets ($M = 479.69, SD = 27.36$). Participants responded significantly slower to Black targets ($M = 495.89, SD = 28.58$) than all other races, including Asian targets ($M = 489.38, SD = 29.05$), as noted above, Middle Eastern targets ($M = 487.78, SD = 30.43$), and White targets ($M = 479.69, SD = 27.36$). There was also a significant difference between Middle Eastern ($M = 487.78, SD = 30.43$) and White targets ($M = 479.69, SD = 27.36$), such that participants responded faster to Middle Eastern targets. The race x object interaction, which was of particular interest in this study as it would support a racial bias based

on congruent and incongruent dangerousness pairings (hypothesis 2), was not found to be significant, $F(3,264) = 1.89, p > .05, \eta^2 = .02$.

Error rates.

Participant error rates (mistakes/timeouts) were calculated for each of the 8 target types mentioned previously. Error rates were then subjected to a 4 (Race: Asian vs. Black vs. Middle Eastern vs. White) x 2 (Armed vs. Unarmed) within subjects ANOVA. The means for each target pairings are provided in Table 5.

Table 5
Error Rates Across Objects and Races

Target	Armed Target		Unarmed Target		Average Across Objects	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Asian	.16	.11	.14	.13	.15	.10
Black	.15	.11	.20	.14	.17	.10
Middle Eastern	.17	.13	.20	.16	.18	.12
White	.10	.10	.15	.13	.13	.10
Average Across Races	.15	.09	.17	.11		

A significant main effect was found for object, $F(1,88) = 7.04, p = .009, \eta^2 = .07$.

Participants made more errors when targets were unarmed ($M = .17, SD = .11$) than armed ($M = .15, SD = .11$). There was also a main effect of race, $F(3, 264) = 11.56, p < .001, \eta^2 = .12$. Post-hoc pairwise comparisons were conducted on all possible racial pairings. Three significant differences were found. Significantly less errors were made for Asian targets ($M = .15, SD = .10$) compared to Middle Eastern targets ($M = .18, SD = .12$). Additionally, more mistakes were made for Black targets ($M = .17, SD = .10$) than for White targets ($M = .13, SD = .10$). Finally, more

mistakes were made for Middle Eastern targets ($M = .18, SD = .12$) than for White targets ($M = .13, SD = .10$). Lastly, the interaction between race and object was significant, $F(3,264) = 8.00, p < .001, \eta^2 = .08$. All pairwise race x object interactions were examined. Figure 1 presents the interactions.

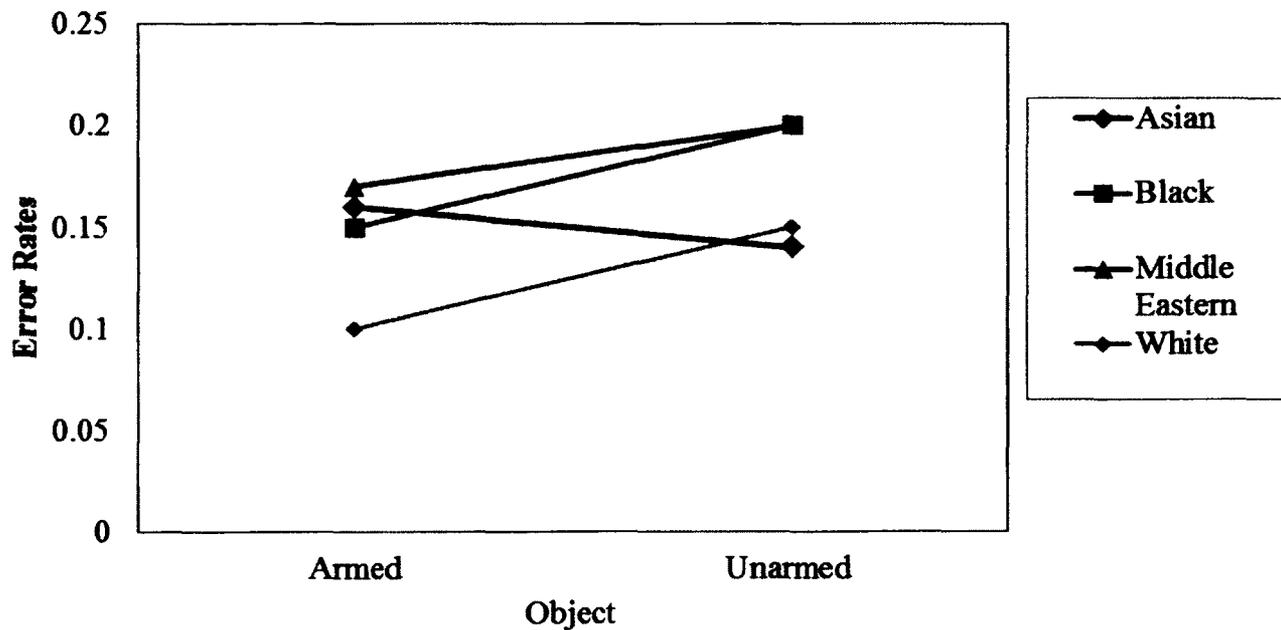


Figure 1. Error rates for the object type as a function of race.

All the race x object interactions involving Asian targets were significant: Asian versus Black, $F(1,88) = 14.06, p < .01, \eta^2 = .14$, Asian versus Middle Eastern, $F(1,88) = 9.28, p < .05, \eta^2 = .10$, and Asian versus White interaction, $F(1,88) = 25.47, p < .001, \eta^2 = .22$). No other simple interactions were significant. In other words, when presented with Asian targets participants made more shooting errors when they were armed compared to unarmed, which was the opposite of what occurred for all other races.

Additional Outcome Measures.

Table 6 presents the means and standard deviations for all of the additional outcome measures.

Table 6

Means and Standard Deviations of Additional Outcome Measures.

Measure	<i>M</i>	<i>SD</i>
MCPRS		
External (/45)	31.52	6.39
Internal (/40)	24.15	5.24
Overall (/85)	55.66	10.28
Adjective Checklist		
Negative Asian Cultural Stereotype Score (/10)	.98	1.77
Negative Black Cultural Stereotype Score (/10)	6.57	3.18
Negative Middle Eastern Stereotype Score (/10)	5.99	3.64
Negative White Cultural Stereotype Score (/10)	2.40	2.72
Negative Asian Personal Stereotype Score (/10)	.72	1.81
Negative Black Personal Stereotype Score (/10)	.95	1.85
Negative Middle Eastern Stereotype Score (/10)	1.78	2.97
Negative White Personal Stereotype Score (/10)	1.70	2.49
In-group Identification (/63)		
White Participants (<i>n</i> = 50)	33.28	14.10
Black Participants (<i>n</i> = 7)	42.00	13.39
East Asian (<i>n</i> = 10)	46.80	5.73

Middle Eastern/ South Asian (<i>n</i> = 9)	44.89	12.13
Aboriginal (<i>n</i> = 1)	59.00	0
Other (<i>n</i> = 11)	36.00	13.22
Prefer not to answer (<i>n</i> = 1)	18.00	0

Motivation to Control Prejudiced Reactions Scale. As indicated previously, the MCPRS is a 17-item scale. Each item is out of 5 points for a total of 85. The higher an individual’s score, the higher their motivation to control prejudice reactions is. The overall mean score for this sample was 55.66 (*SD* =10.28).

Explicit Stereotype Measure. The adjective checklist was used to assess participants stereotypes of the racial groups examined. Recall that for each race, participants were asked to indicate which words they believe represent cultural stereotypes of that group and which words represent their personal stereotypes of that group. As mentioned previously, each time an adjective was selected for a racial group a score of 1 was given. The negative (i.e., danger) adjectives were then totaled for each race to give a score out of 10 for cultural stereotypes and personal stereotypes.

A one way ANOVA was conducted to see if participants selected more dangerous stereotypes for certain racial groups. The omnibus test revealed that negative cultural stereotypes differed based on race, $F(3, 264) = 93.87, p <.001, \eta^2=.75$. Post-hoc comparisons revealed that all pairwise comparisons were significant except for the Black and Middle Eastern pairing. Overall participants selected the most negative cultural stereotypes for Black ($M = 6.57, SD = 3.18$) individuals followed by Middle Eastern ($M = 5.99, SD = 3.64$), White ($M = 2.40, SD = 2.72$), and Asian individuals ($M = .98, SD = 1.77$).

A similar ANOVA was conducted to examine the difference for negative personal stereotypes. The effect of race was again significant, $F(3, 264) = 7.61, p < .001, \eta^2 = .08$. Pairwise comparisons revealed that all pairings were significant except the Asian-Black and Black-White pairings. Overall, participants selected the most negative personal stereotypes for Middle Eastern individuals ($M = 1.78, SD = 2.97$), followed by White ($M = 1.70, SD = 2.49$), Black ($M = .95, SD = 1.85$), and Asian individuals ($M = .72, SD = 1.81$).

In-group Identification Measure. Recall that the in-group identification measure has a total possible score of 63, with higher scores indicative of a higher level of in-group identification. Due to the nature of the measure, and given the fact that it is examining racial in-groups, it was important to examine scores based on the racial in-group participants identified with. Only one individual identified as Aboriginal and one selected 'prefer not to answer'. Beyond these two racial groups, those who identified as East Asian had the highest in-group identification scores ($M = 46.80, SD = 5.73$), followed by Middle Eastern/South Asians ($M = 44.89, SD = 12.13$), Blacks ($M = 42, SD = 13.39$), those who identified as 'Other' ($M = 36.00, SD = 13.22$) and lastly, White participants had the lowest in-group identification scores ($M = 33.28, SD = 14.10$). A one-way ANOVA revealed significant differences for in-group identification scores based on race, post-hoc pairwise comparisons found one significant difference between White participants and Asian participants. To examine hypothesis four correlations were run to examine the relationship between in-group identification scores and shooting biases (as determined by the indices described below).

Correlates of Racial Biases in Shooting Decisions.

To examine correlates of racial biases in shooting decisions a single score was needed to represent racial biased shooting decisions. The following formula to calculate Object Effect was

developed by Sadler et al. (2012) specifically to examine racial bias when using multiple racial groups. The formula calculates a single score for each race that examines the effect of object based on race ($RT \text{ Object Effect}_{\text{Race}} = RTRace_{\text{no gun}} - RTRace_{\text{gun}}$). According to Sadler et al. (2012), this single score, based on reaction times is a representation of a predisposition to shoot armed targets faster than unarmed targets. If a group is perceived to be dangerous then participants would likely respond slower when they do not have a gun than when they do (based on congruencies with dangerousness). This would result in a large Object Effect score. Thus, a higher score is indicative of a greater bias in reaction times. Table 7 presents the mean Object Effect Scores for each race. An ANOVA was run to determine if Object Effect varied significantly between races. The ANOVA revealed no significant differences between races ($F(3,264) = 1.893, p > .05, \eta^2 = .02$). This finding makes sense as these indices examine reaction times, and there was no significant race by object interaction found.

Similar Object Effect indices were computed for each race that examined errors as opposed to reaction times, similar formulae was used ($RT \text{ Object Effect}_{\text{Race}} = \text{ErrorRateRace}_{\text{no gun}} - \text{ErrorRateRace}_{\text{gun}}$). Since a significant race by object interaction was present in the error data these indices made more sense for this particular study. Similar to the reaction time Object Effect a higher score is more indicative of a greater bias as it indicates more mistakes made by mistakenly shooting those who are unarmed compared to not shooting those who are armed. Table 7 presents the means and standard deviations for these Object Effects. An ANOVA revealed significant differences between races ($F(3,264) = 8.00, p < .001, \eta^2 = .23$). Post-hoc pairwise comparisons revealed that the all significant pairings involved the Asian Object Effect, such that Asian Object Effects ($M = -.03, SD = .15$) was significantly lower than all other races.

Although past research examining multiple races (Sadler et al., 2012) has only examined the reaction time Object Effect it was more important to focus on the error Object Effect for this particular study due to the lack of a significant interaction for reaction times. Because of this, the moderation analyses below only examined the error Object Effects.

Table 7

Means and Standard Deviations of Object Effects for Each Race

Object Effect	<i>M</i>	<i>SD</i>
Reaction Times		
Asian Target	41.54	36.61
Black Target	37.17	33.94
Middle Eastern Target	41.54	29.51
White Target	46.61	28.99
Error Rates		
Asian Target	-.03	.15
Black Target	.05	.15
Middle Eastern Target	.03	.14
White Target	.05	.12

Next, these racial bias indices were correlated with the MCPRS and the adjective checklist scores. Table 8 presents these correlations.⁵ We expected negative correlations between the MCPRS and the indices of shooting bias and we expected positive correlations between the adjective checklist scores and the indices of shooting bias. Due to the nature of the in-group identification measure, correlations between this measure and the racial bias indices were calculated separately based on participant's identified racial group. Table 9 presents these correlations (analyses were not conducted on those who selected Aboriginal or 'prefer not to answer' as there was only one participant in each of these categories). We expected positive correlations between participants' in-group scores and indices of shooting bias for out-group members (Hypothesis 4). This hypothesis was not supported.

Of particular interest in this study was if and how the self report measures correlated with the racial bias indices. None of these correlations were significant. The only correlations found to be significant were between measures of the same construct (e.g., between sub-scales of the MCPRS, between different cultural stereotype measures, etc.).

⁵ Additional correlations were conducted on demographic variables (video game experience, hunting experience and age) to determine if these factors were related to shooting biases, no significant correlations existed.

Table 8

Correlations between the MCPRS, Adjective Checklists, and Calculated Bias Indices

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. MCPRS External	-																	
2. MCPRS Internal	.56*	-																
3. MCPRS Overall	.91*	.86*	-															
4. Neg. Asian Cult. Adj.	.10	-.01	.06	-														
5. Neg. Black Cult. Adj.	-.01	-.12	-.06	.09	-													
6. Neg. Mid. East. Cult. Adj.	-.12	-.24	-.20	.25	.51*	-												
7. Neg. White Cult. Adj.	.05	.06	.06	.01	-.10	.14	-											
8. Neg. Asian Pers. Adj.	.03	.03	.04	.51*	.14	.12	.03	-										
9. Neg. Black Pers. Adj.	-.18	-.22	-.22	-.02	.19	.05	.05	.13	-									
10. Neg. Mid. East. Pers. Adj.	-.15	-.20	-.20	.20	.24	.32	.06	.60*	.50*	-								
11. Neg. White Pers. Adj.	-.01	.06	.03	.24	.14	.08	.37	.51*	.23	.42*	-							
12. Asian Obj. Effect (RT)	-.11	-.09	-.12	.08	.15	-.01	.13	-.07	.04	-.04	.22	-						
13. Black Obj. Effect (RT)	-.02	-.09	-.06	.09	.02	-.14	.01	-.13	.16	-.09	.00	.34	-					

14. Mid. East. Obj. Effect (RT)	-.10	-.12	-.12	.10	.10	.08	.13	.04	.11	.04	.14	.30	.41*	-				
15. White Obj. Effect (RT)	.03	-.08	-.02	-.14	.10	-.11	-.05	-.27	.10	-.15	-.02	.49*	.25	.22	-			
16. Asian Obj. Effect (E)	-.07	-.10	-.10	-.01	.09	.04	.02	.10	.22	.26	.07	.17	.23	.28	.22	-		
17. Black Obj. Effect (E)	.08	.08	.09	-.09	.00	.24	-.04	-.24	.09	-.18	-.08	.12	.37	.08	.34	.13	-	
18. Mid. East. Obj. Effect (E)	-.01	.19	.09	.07	-.04	-.20	.12	-.02	.11	-.12	.02	.04	.11	-.23	.06	.14	.19	-
19. White Obj. Effect (E)	.16	.08	.14	.02	.17	-.06	-.06	.01	.07	-.01	-.05	.14	.13	.13	.24	.39*	.22	.18

Note. Bonferroni correction = $.05/171 = .0002$.

*Correlations significant at the corrected alpha level.

Table 9

Correlations between the In-group Identification Scores and Racial Bias Indices Based on Participant Race

Participant Race	RT Object Effects				Error Object Effects			
	Asian	Black	Mid. East	White	Asian	Black	Mid. East	White
White	.13	.14	.18	.04	.14	-.13	.15	.16
Black	.23	.26	.09	.23	.17	-.22	.13	.25
Asian	.57	.29	.21	.03	.52	.10	-.06	.33
Mid. East/South Asian	-.10	.46	-.22	.44	-.05	.58	.17	.16
Other	-.20	.20	-.33	-.43	-.24	-.25	-.34	-.01

Note. Bonferroni correction = .05/40 = .001

**Correlations significant at the corrected alpha level.*

Moderation Analyses. Although no significant correlations were found between the explicit stereotype measures, moderation analyses were conducted to examine the second part of hypothesis three. It was hypothesized that the MCPRS would moderate the relationship between the explicit stereotype measure and racial biases on the shooting task. Specifically, participants scores for each race on the adjective checklist (personal only) was expected to correlate positively with shooting bias (for each race) as determined by the Object Effect error indices but only for those low on the MCPRS. To test this, moderated hierarchical regressions were used because the MCPRS is a continuous measure. The first step involved converting all relevant measure's scores into standardized z-scores. Next, the predictors, in this case the personal adjective checklist scores and the moderator (the MCPRS), were regressed on the racial bias indices (each of the Object Effect scores). Lastly, the interaction term of the predictor and moderator (Adjective x MCPRS) was regressed on the indices. The R^2_{change} was examined as an indicator of moderation effect size. Analyses for Asian targets revealed a significant R^2_{change} (β

$=.28, t(85) = 2.67, p < .05, R^2_{change} = .08$), supporting the hypothesis that MCPRS does moderate the relationship between negative stereotypes and the shooting bias for this particular racial group. Analyses for Black targets however, revealed no significant moderation effect of MCPRS ($\beta = .02, t(85) = .12, p > .05, R^2_{change} = .00$). Analyses for Middle Eastern targets also revealed no significant moderation effect ($\beta = .21, t(85) = 1.60, p > .05, R^2_{change} = .03$). Lastly, the moderation analyses for White targets revealed no significant moderation effects ($\beta = .16, t(85) = 1.41, p > .05, R^2_{change} = .02$). The only significant moderation effect of the MCPRS was found when examining Asian stereotypes and the Asian error Object Effect. Overall, hypothesis three was not supported.

Discussion

The primary goal of this study was to investigate racial shooting biases on a simulated computer shooting task. To examine potential biases, shooting data was analyzed. It was expected, in hypothesis 1, that participants would set significantly different shoot criteria (c) based on stereotypes of dangerousness identified in previous research, whereby participants would be more trigger happy for targets generally perceived to be more dangerous (Middle Eastern and Black). It was also anticipated, in hypothesis 2, that armed targets who have been associated with danger stereotypes in previous research (Middle Eastern and Black) would be shot at more often and quicker than armed targets who have not been associated with such stereotypes (White and Asian targets), whereas it was expected that no shoot decisions would be made more often and quicker for unarmed non-dangerous targets (Asian and White) than unarmed dangerous targets (Middle Eastern and Black). Finally, a range of additional outcome measures were examined (e.g., MCPRS, in-group identification, and explicit stereotypes) with the expectation that scores on these measures would relate to biases in shooting decisions

(hypothesis 3). Specifically, it was anticipated that the dangerous groups identified in past research (Middle Eastern and Black) would receive higher scores on the adjective checklists and that scores on this measure would correlate with shooting bias (the MCPRS was expected to moderate these types of relationships). Additionally it was expected, in hypothesis 4, that those who scored higher on the in-group identification measure would present more racial bias on the shooting task against those targets not belonging to the participant's racial group. In the discussion that follows, the results emerging from each part of the thesis will be discussed. The thesis will conclude with a discussion of study limitations and future research directions.

Manipulation check

In addition to validating the adjectives included on the adjective checklist, the manipulation check examined if participants were able to correctly identify the model's racial background. Overall, participants did very well and were able to correctly match the models that were going to be included in the simulated shooting task to the model's actual racial group. The only serious exception was with the Aboriginal models. Participants did very poorly in identifying these models as Aboriginal. Because of this, Aboriginal targets were not included in this study.

Beyond the problems that this result caused for the current study, the finding that participants were not able to correctly identify Aboriginal targets as Aboriginal brings up questions about previous research. Specifically, this finding speaks to potential problems in the study conducted by Harmer et al. (2011), which involved Aboriginal targets, but where no manipulation check was conducted. In that study, the Aboriginal models tested in the current study were used and participants did display a clear negative bias against these (vs. White) targets in their shooting decisions. The fact that participants in the current study could not

correctly identify these models as Aboriginal calls into question the mechanism that we believed was causing the shooting bias in the previous study (i.e., because participants seem unable to identify these targets as Aboriginal it is unlikely that an Aboriginal ‘danger’ stereotype caused them to be biased in the previous study).

The current manipulation check certainly demonstrates the importance of conducting such checks in research of this type and suggests that additional research is needed that looks specifically at Aboriginal shooting biases (and their underlying causes). Indeed, since Aboriginals are such a well represented group in Canada, and research has continually found negative stereotypes associated with them (e.g., Royal Commission on Aboriginal Peoples, 1996; Harding, 2005), it is important that further research examines the shooting bias found by Harmer et al. (2011) and attempts to understand what mechanisms were driving this bias.

Signal Detection Analyses

The purpose of the signal detection analyses was to determine: (1) if participants set different criterion (c) for making shoot responses as a function of target race and (2) whether participants exhibited different levels of sensitivity (d') for targets of different races (indicating their ability to discriminate between armed and unarmed targets). With respect to c , results revealed that participants did in fact set different shoot criteria depending on the targets race. Specifically, for three of the four racial groups participants exhibited an overall bias to shoot (negative c 's). Participants only displayed a no-shoot bias (a positive c) for Asian targets.

As indicated in hypothesis 1, this finding for Asian targets was expected given that previous research (and are own participants' personal stereotypes) suggests that Asians are not associated with dangerous stereotypes (Schaller et al., 2002). However, based on previous research from the US it was not necessarily expected that the criterion set by participants for

Black, Middle Eastern, and White targets would essentially be the same. Indeed, based on previous research, we expected (hypothesis 1) that participants would set lower criteria for Black and Middle Eastern targets compared to White targets since these groups are often associated with high levels dangerousness.

With that said, as indicated in the introduction, there is a small amount of recent unpublished research that is based on Canadian participants, which highlighted the possibility that a strong shoot bias might be found for White targets (e.g., Bennell & Taylor, 2010). The personal danger stereotypes for White individuals that were endorsed by participants in the current study are also consistent with such a finding. Taken together, the current research findings combined with the previous unpublished research conducted on Canadian participants suggests that these participants may differ fundamentally in the stereotypes they hold relative to their American counterparts. There could be many underlying mechanisms to explain why Canadians differ from Americans in the stereotypes they hold, however, a potential explanation comes from the amount of contact that Canadians and Americans have with out-groups. For example, Canada's foreign born population (18%) is significantly higher than the U.S's (11%; Samuel & Basavarajappa, 2006) and research (e.g., McGlothlin & Killen, 2006; McClelland & Linnander, 2006) has found that more contact with a group tends to lead to less biases and stereotypes.

Importantly, unlike in the case of Bennell and Taylor's (2010) study, the current participants exhibited these results in a context where it was unlikely that they were overcorrecting for negative Black stereotypes. As Bennell and Taylor discuss, one hypothesis for their previous results was that given the nature of their shooting task, which included only Black and White targets, it was obvious that the study was about Black-White biases. Under such

circumstances it is plausible that participants would try to hide any Black biases they might typically exhibit and instead manifest a White bias. The use of multiple racial groups in the current study, which should conceal any specific race comparisons that we wished to make, goes some way towards addressing the overcorrection hypothesis and again indicates that Canadian participants may perceive White targets as potentially more threatening/dangerous than other racial groups that have historically been associated with such stereotypes (e.g., Blacks).

The second part of the signal detection analysis examined d' , which reflects participants' ability to distinguish armed and unarmed targets for each race separately. Overall, participants in the current study exhibited the most sensitivity for White and Asian targets. Based on previous research we did not expect any differences in d' across the races (hypothesis 1). For example, for the generally 'safe' Asian and White targets, errors were expected for armed models because they would be mistakenly perceived as unarmed (this would lower d'). On the other hand, for the generally 'dangerous' Middle Eastern and Black targets, errors would be expected for unarmed models because they would be mistakenly perceived as armed and (this would also lower d'). This second part of hypothesis 1 was therefore not supported.

The fact that d' was slightly higher for Asians and Whites is therefore somewhat of a surprise and difficult to explain. What it does show though is that criteria for setting thresholds for making shoot decisions (c) and one's sensitivity to armed and unarmed targets (d') are independent processes (Green & Swets, 1966). In other words, people who are highly sensitive to armed and unarmed targets (as our participants are to Asian and White models) can set either strict thresholds for making shoot decisions (in the case of Asian targets) or relatively lenient thresholds (in the case of White targets). Presumably, as previous researchers have stated (Correll et al., 2007), these thresholds are indicative of automatically activated stereotypes (safe

stereotypes for Asians lead to strict shooting thresholds and danger stereotypes for Whites lead to lenient shooting thresholds), whereas the results related to d' are indicative of how much effort goes in to scanning the simulated use of force encounters in order to identify weapon presence. Why scanning effort varied across the races is something that will have to be examined more thoroughly in future research.

Reaction Time

Analyses of reaction times for making correct decisions were also conducted. A main effect was found for both object and race, but in contrast to what was expected (hypothesis 2) no interaction was found. With respect to object, participants responded quicker when targets were armed than when they were unarmed. This finding intuitively makes sense and has been found in past research (e.g., Bennell & Taylor, 2010). Presumably it is easier for participants to press a key (an action) to represent a shoot decision (also an action) than to make an active response (press a button) to represent a don't shoot decision (a lack of action). This issue is further discussed later in the limitations of the study.

With respect to race, post-hoc analyses found that certain races were reacted to faster than others. Reaction times to make shoot decisions were particularly interesting. In this case, participants shot White targets fastest, followed by Middle Eastern targets, Asian targets, and Black targets. While not necessarily hypothesized (it was the object x race interaction that was hypothesized), these results may be important, especially because they correspond to research conducted by Bennell and Taylor (2010), which suggests that Canadian participants exhibit biases towards White targets. However, since the hypothesized interaction was not supported it is difficult to interpret the nature of the reaction time biases in the present study.

Error Rates

Similar to reaction times, error rates were analyzed for the effect of object and race as well as the interaction between these variables. Results found both main effects to be significant, but what is of particular interest is the significant interaction that was also found. Based on previous research it was hypothesized (hypothesis 2) that races that tend to be least associated with dangerous stereotypes (Asians and Whites) would generate more errors when these targets appeared armed, but that races that tend to be associated with dangerous stereotypes would be associated with more errors when these targets appeared unarmed. This hypothesis was partially supported as the expected finding was confirmed for Asian targets, but not for any of the other races.

Only the Asian simple interaction was significant indicating that participants made more shooting errors when the target was armed than when they were unarmed. All other races had an opposite trend such that participants made more shooting errors when targets were unarmed. Interestingly, and consistent with some other Canadian research (e.g., Bennell & Taylor, 2010), White targets were reacted to in a similar manner as other 'dangerous' races (Black and Middle Eastern), they were mistakenly shot with a relatively high frequency when they were unarmed. Since the hypotheses in this thesis were based on previous research it was not anticipated that these results would be found for White targets. The most obvious suggestion as to why this was found is that Canadians hold different stereotypes than Americans, which past research has focused on. Looking at the outcome measures described below, some of these unexpected results may be able to be explained.

Other Outcome Measures, Correlations and Moderation Analyses

Explicit Stereotype Measure. Analyses of the explicit stereotype measure were very interesting. The results revealed that participants identified different racial groups as being more dangerous depending on whether they were rating groups according to cultural or personal stereotypes. When reporting cultural stereotypes, Black individuals were rated as the most dangerous, followed by Middle Easterners, Whites, and Asians. However, when participants were asked about personal stereotypes Middle Easterners were rated as being the most dangerous, followed by Whites, Blacks and Asians. It is clear that participants report having very different personal stereotypes than what they believe exist culturally. The differences between dangerousness scores between cultural and personal measures are likely due to participant's socially desirable responding as people are likely more willing to admit that society holds a certain stereotype than to admit they themselves hold this stereotype. Future research may find value in examining cultural stereotype measures as they appear to be less influenced by socially desirable responding and therefore may be more consistent with biases observed.

Motivation to Control Prejudiced Reactions. Alone this measure does not provide much insight; however, it is an important measure to examine along with other variables or as a moderator. Correlation analyses revealed no significant correlates of the MCPRS except within itself (i.e., the overall scale correlated with both of the subscales and the subscales correlated with each other). This was not surprising as the MCPRS is also an explicit measure and participants may be worried about presenting a desire to hide prejudiced reactions, as that would suggest that they are in fact prejudiced. It was expected in hypothesis 3 that this measure would be a significant moderator between explicit racial biases and biases observed on the shooting task. The findings of this measure as a moderator are discussed below.

In-group Identification Measure. The in-group identification measure was examined to see if participants who more closely identify with their racial in-group would be more biased towards other groups. Analyses found no significant relationship between in-group identification scores and the bias indices calculated. The reason for this may be that participants in this sample did not generally associate highly with their in-groups. Indeed, the highest group mean was 46.80 out of 63 for East Asians. Because of the diverse nature of the city where the study took place it may be that the melting pot culture has reduced participant's in-group associations.

Correlates of Racial Biases. Correlational analyses were conducted on all of the self-report measures (MCPRS, adjective checklists, and in-group identification) as well as the bias indices calculated for each race. In contrast to what was expected (hypothesis 3), the results of the analyses found few significant correlations. The only significant correlations were found between sub-measures that were measuring similar constructs (e.g., a strong correlation between cultural negative Asian stereotypes and personal negative Asian stereotypes).

The number of negative adjectives selected by participants was not significantly correlated with the shooting bias indices. It did not matter whether the measure examined personal stereotypes or cultural stereotypes there was no correlation between the number of negative adjectives participants selected and the four indices of shooting bias. Likely there was no relationship between the explicit stereotype measure and the shooting task because of socially desirable responding. Indeed, previous research would suggest that participants likely responded to the adjective measures in a socially desirable way so as not to appear racist (Fazio & Olson, 2003). In contrast, since the shooting task is arguably an implicit stereotype measure (since it relies on fast reaction times to assess participants' associations between certain races and expectations of weapons) it is more likely than explicit measures to pick up on the stereotypes

endorsed by our participants (Olson & Fazio, 2004). Previous research has suggested that implicit stereotype measures and explicit stereotype measures are often uncorrelated (Boniecki & Jacks, 2002) and thus, the low correlations in the current study are not that unusual. Since correlating an implicit measure (shooting task) and an explicit measure (adjective checklist) yielded no significant relationship future research should examine other types of measures to examine stereotypes (see below for a more detailed discussion of this issue).

Additionally, there was no relationship between the MCPRS and any other measures, including the indices of racial bias on the shooting task. Why were no correlations found? There are likely multiple explanations for this, but one possibility again has to do with social desirability. Although the MCPRS does not specifically examine prejudiced views (but rather peoples desired to control the expression of their prejudiced views) it may still be that our participants felt the need to respond in a socially desirable way (i.e., indicating that if they had prejudiced views they would be motivated to control them). If this occurred, no strong correlations between this measure and the other measures would necessarily be expected.

In addition, it was hypothesized (hypothesis 3) that the MCPRS would moderate the relationship between participant's explicit stereotypes and shooting biases. Out of the four races (and four moderation models) examined only in the model examining Asian targets was the MCPRS found to be a significant moderator between negative personal stereotypes and the error Object Effect. Overall, hypothesis 3 was not supported, but it is interesting to note the one significant model. Further analyses should examine what may drive the moderation of the MCPRS for Asian targets and not for the other racial groups.

Like the explicit stereotype measure and the MCPRS, the in-group identification measure was also not significantly correlated with any of the shooting bias indices. Based on research by

Kenworthy et al., (2011) it was hypothesized that individuals who had higher in-group identification scores would display more of a bias towards targets from other racial groups (i.e. out-group members). Overall hypothesis 3 and 4 were not supported because of the lack of any significant relationships or moderation effects between measures and the shooting task.

Limitations and Future Directions

Lack of Realism. One of the biggest concerns with the current study is that the stimuli are unrealistic. Although this method of using two dimensional, static stimuli for a simulated shooting task has been used numerous times (e.g., Correll et al., 2002; Bennell & Taylor, 2010; Harmer et al., 2011; Sadler et al., 2012), there are clear problems with the current stimuli and the delivery of that stimuli. The photos that we used lack realism as they are both inanimate and two dimensional. One concern relates to the way in which the targets are holding the items. To ensure that participants could see the objects they were positioned in certain ways (e.g., pointing to the side), and none of these positions involved targets pointing the items directly at the camera as if to shoot, which would be the norm in naturalistic settings. This aspect of the photos may have led to the stimuli not being as threatening as an armed target has the potential to be.

Of additional concern was the unrealistic method used by participants to 'shoot' or 'not shoot'. Participants indicated their response by pressing keys on a keyboard (pressing one key to shoot and another to not shoot). Since shooting is an action and so is pressing a key this may be easier for participants to grasp (cognitively) compared to performing an action (pressing a key) to represent a lack of action (not shooting). This issue may have made the shooting decision easier than no shoot decisions (though far from actually pulling a trigger) which might explain the bias found towards shooting targets.

Lastly, there is a concern with the unrealistic laboratory setting in which participants completed the task. Since participants were only focused on the task at hand in a controlled laboratory setting that eliminated the typical sorts of cues that would be found in naturalistic settings (e.g., noise, bystanders, complex scenes etc.) the results obtained in this study may not generalize to actual shooting decisions. For example, in the presence of such complicating factors participants may display greater shooting biases than were found here given that their ability to rely on controlled cognitive processes to override stereotyped responses would likely be compromised (Payne, 2001).

Future research should use more realistic stimuli. Moving three dimension stimuli would increase the ecological validity of shooting studies. Additionally, it would also be interesting and relevant to use a simulated weapon to respond to stimuli instead of using key presses on a keyboard. Attempts should also be made to include other variables in the shooting scenarios to mimic real life conditions (e.g., background noise, simulated bystanders, moving scenes, etc.).

Lack of Comprehensive Racial Groups. As the main goal of this study was to examine multiple races it was important to have stimuli that represented a range of ethnic groups. However, it was not possible to examine a very large range of racial groups. One of the most obvious challenges in accomplishing this in the current study was that participants in the manipulation check could not correctly identify the Aboriginal targets as Aboriginal and they were thus removed from the main study. Additionally, there are other racial groups that could have been included in this study (e.g., Latinos). The primary reason for not including additional racial groups is that doing so would make the shooting task too onerous (in terms of the number of trials needed to get reliable shooting data for each group). This limits the extent to which one

can examine (in a single study) the sorts of shooting biases that might be exhibited in a multicultural Canadian context.

Much like Sadler et al. (2012), we believe that using 4-5 racial groups was a good starting point for research in this area, but future research will have to be conducted to expand upon these studies. Future research should aim to include a broader range of racial groups. Beyond expanding the racial groups that are examined, it would also be of interest to examine the interaction of race, gender, and age to determine the joint influence of these factors on shooting decisions. As indicated in the introduction, Plant et al. (2011) have recently examined the interaction between race and gender, but they only examined two races and the research was not conducted in a Canadian context. Such research will be important to conduct in the future.

Incomplete Sample of Participants. This study examined a very specific population of participants, undergraduate University students from Ontario. One problem with using this sample is that university students may be exposed to certain racial groups in this particular geographic area that are not necessarily representative of Ontario's overall demographics or those of the rest of Canada. Since the present participants reside in a large metropolitan area they likely will have interacted with the various racial groups tested in this study and this may reduce racial biases in their shooting decisions since research has suggested that increased contact with racial groups decreases stereotypes (Schaller et al., 2002). The very specific and fairly homogenous sample of participants that we tested also prevents any generalization from the results.

Previous research in this area has gone beyond the use of students and has included police officers in the research (e.g., Bennell and Taylor, 2010; Correll et al., 2002; Sadler et al., 2012). Using police officers as participants has allowed researchers to examine if the

training/experience that officers possess reduces or increases biases on the shooting task. It would be of interest to replicate the current study using Canadian police officers given that they are the ones that make lethal force decisions in naturalistic contexts. Based on previous research it is unclear whether these officers would perform better (i.e., be less biased) than students (e.g., Correll et al., 2007a; Plant & Peruche, 2005).

Potentially Problematic Measures. Because no relationships were found between the self report measures (adjective checklists, the MCPRS, and the in-group identification) and shooting biases it may be that there are problems with these measures. As discussed previously, it is likely that with the explicit measures of stereotypes (and the MCPRS) participants responded in a socially desirable manner and this may have resulted in the lack of correlations between these measures and the shooting task. Future research should examine other implicit measures of racial stereotypes (and motivation to control prejudiced reactions). One particularly useful measure for assessing the associations between racial groups and constructs such as safe and dangerous might be the implicit associations task (IAT), which has been found to be more resistant to socially desirable responding (Greenwald, McGhee, & Schwartz, 1998). Significant correlations may be more likely between this measure and the shooting task.

One additional concern with the explicit stereotype measure, which was only realized after the study was complete, is that the words used in the adjective checklist were in fact not all adjectives. Although the original measure uses only adjectives, the explicit measures used in this study to assess personal and cultural stereotypes included various words that could be used to describe groups of people consisted of both adjectives (e.g., violent) and nouns (e.g., killer). This could have been problematic since participants may not perceive nouns as proper

descriptors of groups. If this influenced participants, the result may have been lower dangerousness scores.

Conclusion

This thesis aimed to examine multiple racial biases in simulated shooting decisions and how these biases may be related to various explicit measures. It was hypothesized that negative biases would be seen through errors, reaction times, and a signal detection index(*c*) towards races associated with danger (Black and Middle Eastern) in previous research. Biases were found for reaction times and *c* however they were mainly in support of a *positive* shooting bias towards Asian targets. Specifically, participants displayed a no-shoot bias (*c*) towards Asian targets, and they made more errors when Asians were armed, as they mistakenly did not shoot at them.

No explicit measures were found to be directly related to shooting bias indices. One moderation effect was found as the MCPRS did moderate the relationship between negative personal Asian stereotypes and the error Object Effect for Asians. There were limitations in this study as discussed above and future research should examine different measures, and more realistic and/or representative stimuli.

The findings of this thesis may have real-world implications in the world of Policing. The positive bias displayed towards Asians may have its own risks if it is found in officers as this could put them in danger if they mistakenly do not shoot when they should (the target is armed), as this thesis found with our sample. Officer training should ensure that both types of biases are accounted for as a positive bias may be just as dangerous to an officer as a negative bias may be to an offender.

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[4711/ 1/Yoshida_Emiko.pdf](http://uwspace.uwaterloo.ca/bitstream/10012/4711/1/Yoshida_Emiko.pdf)

Appendix A

Image Development Informed Consent Form

The purpose of an informed consent is to ensure that you understand the purpose of the study and the nature of your involvement. The informed consent must provide sufficient information such that you have the opportunity to determine whether you wish to participate in the study.

Study Title: The development of stimuli for examining stereotype effects on shooting decisions

Faculty Sponsor: Dr. Craig Bennell Phone:520-2600.1769 EMAIL: craig_bennell@carleton.ca

Principle Investigator: Sarah Harmer EMAIL: sharmer@connect.carleton.ca

If you have any ethical concerns about how this study is conducted, please contact Dr. Monique Senechal (Chair of the Carleton University Research Ethics Committee for Psychological Research, 520-2600 x. 1155) or Dr. Anne Bowker (Chair of the Department of Psychology at Carleton University, 520-2600 x. 8218).

Purpose and Task Requirements: The aim of the present study is to develop the study stimuli that can be used to identify factors that influence shooting decisions and subsequently develop training strategies to help individuals make more accurate decisions. We will be asking you to pose in a variety of positions and have you're your photo taken. Most photos will require you to hold either threatening (mock-weapons) or non-threatening (cell phone and wallet) items. This photo-shoot will take approximately 30 minutes and we will take 40 photos.

Potential risk/discomfort. You will be asked to hold mock-handguns and everyday items (a cell phone and wallet). You should be aware that there is no risk to your safety, as all weapons are fake and all photos will be taken in the secure environment of the lab. You will be asked to pose in a variety of positions (e.g., standing, kneeling), however none should cause you any discomfort or embarrassment. If you do feel uncomfortable at any point or do not want to pose in a certain position, please tell the research assistant.

Right to withdraw and confidentiality. Your participation in this study is entirely voluntary. At any point during the study you have the right to withdraw and there will be no penalty whatsoever. Your name will never be associated with your photo and the photos of you will be secured on a lab computer. The photos will only be used for research and teaching purposes. You should be aware that if you choose to participate, your photos could be used in a publication to show an example of the stimuli used.

I have read the above description of the study entitled "The development of stimuli for examining stereotype effects on shooting decisions". The data collected will be used for research and/or teaching purposes. My signature indicates that I agree to participate in the study, and this in no way constitutes a waiver of my rights.

Full Name (please print): _____

Participant Signature: _____

Date: _____

Researcher Signature: _____

Date: _____

Appendix B

Image Development Debriefing Form

We would like to thank you for participating in this research. Your time and efforts are greatly appreciated! This post-session information is designed to help you understand the exact nature of this research.

Our current research program involves: (1) identifying factors (e.g., suspect ethnicity) that influence shooting decisions (amongst university students and police officers) and (2) developing training strategies to minimize the impact of these factors. The photos of you will act as stimuli in subsequent phases of this research. Participants will be shown these photos on a computer and will be asked to make split-second decisions as to whether or not they are looking at a threatening scene (e.g., handgun present) or a non-threatening scene (e.g., a cell phone present). The participants will have to choose either to shoot the target or not shoot depending on whether the suspect is armed (by pressing separate computer keys). By measuring decision outcomes and reaction times, the computer program will be used to identify which factors results in participants making accurate/inaccurate decisions. Based on previous research, we expect that university students will make shooting decisions that are consistent with danger stereotypes (e.g., that certain races are more dangerous than White people). For example, we are predicting that students will be more likely to shoot unarmed Aboriginal suspects compared to unarmed white suspects. Based on previous research, it is less clear that shooting biases will exist amongst police officers.

Once we determine if irrelevant clues, such as suspect ethnicity, influence shooting decisions, the next phase of our research program will be to examine different training strategies to see if we can minimize the extent to which participants focus on irrelevant cues when making shooting decisions and maximize their use of relevant cues (e.g., the presence/absence of a weapon). This research program has important theoretical implications. For example, we will learn whether stereotypes about various racial groups translate into biased behaviour in a setting where the stakes can be very high (e.g., shooting scenarios). In addition, we will learn about ways that people can control their responses to stereotypes so that inappropriate decisions are not made. In practical terms, the research is also very important. For example, the studies we conduct have the potential to inform use of force training programs, allowing police officers to receive higher quality training than is currently the case. Better training should result in more justifiable shooting decisions, which will ultimately enhance public safety.

To learn more about this research, you can read the following articles:

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

Correll, J., Park, B., Judd, C.H., Wittenbrink, B., Sadler, M.S., & Keesee, T. (2007). Across the thin blue line: Police officers and racial bias in the decision to shoot. *Journal of Personality and Social Psychology*, 92, 1006 – 1023.

If you have any question or comments about this research, then please feel free to contact Dr. Craig Bennell (520-2600 x. 1569). If you have any ethical concerns about how this study was conducted please contact Dr. Monique Senechal (Chair of the Carleton University Research Ethics Committee for Psychological Research, 520-2600 x. 1155) or Dr. Anne Bowker (Chair of the Department of Psychology at Carleton University, 520-2600 x. 8218). If you are upset or anxious after completions of this study, please contact Carleton University's Health and Counseling Services (613-520-6674).

Appendix C

Example Shooting Task Stimuli



Appendix D

Manipulation Check

What racial/ethnic group do you believe the person in the image above belongs to?

- White/ Caucasian
- Black
- Aboriginal
- Other
- East Asian (e.g., Chinese, Japanese)
- Middle Eastern or South Asian (e.g., Iraqi ,Indian)

Please indicate on the scale below how much you associate each of the following words with a 'safe' person, or a 'dangerous' person.

1. Safe	2.	3.	4.	5. Neither Safe or Dangerous	6.	7.	8.	9.	10. Dangerous
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Words used in manipulation check:

DANGEROUS WORDS

- Suspicious
- Aggressive
- Hostile
- Frightening
- Criminal
- Extreme
- Intimidating
- Dangerous
- Threatening
- Menacing
- Violent
- Fierce
- Killer
- Intense
- Attacker
- Scary
- Explosive
- Horrible
- Bully
- Destructive
- Loud
- Angry
- Furious
- Forceful
- Vicious
- Cruel
- Brutal
- Fighter
- Vile
- Evil

SAFE WORDS

- Safe
- Trustworthy
- Considerate
- Reliable
- Realistic
- Wary
- Prudent
- Dependable
- Secure
- Just
- Strong
- True
- Affectionate
- Introverted
- Sympathetic
- Cowardly
- Easy-going
- Friendly
- Kind
- Nice
- Polite
- Gentle
- Sedate
- Obedient
- Likeable
- Loving
- Responsible
- Warm
- Comforting
- Protective

Appendix E

Manipulation Check Recruitment Announcement

Study Name: The verification of stimuli for examining stereotype effects on shooting decisions

Purpose: The aim of the present study is to check the study stimuli that can be used to identify factors that influence shooting decisions and subsequently develop training strategies to help individuals make more accurate decisions.

Description: We will ask you to judge various images presented to you on a computer and record your responses with pen and paper. This task should take you approximately 30 minutes.

Sign-Up Restrictions: Must NOT have signed up or completed ANY of these studies:

- A Police Officer's Shooting Intention
- An Examination of Police Officer Shooting Decisions
- An Examination of Stimuli used to make Police Officer Shooting Decisions
- Beliefs Related to Police Use of Force Encounters
- Examining the Effect of Variable Use of Force Decision Thresholds.
- Police Officer Shooting Decisions: An Examination of When to Use Force
- A Study Examining Shooting Decisions

Course Restrictions: Participants must be in at least one of these courses:

- PSYC 1001 B
- PSYC 1001 I
- PSYC 1002 B
- PSYC 1002 C
- PSYC 1002 D
- PSYC 1002 E
- PSYC 1002 F
- PSYC 1002 G
- PSYC 1002 H
- PSYC 1002 P
- PSYC 1002 Q
- PSYC 1002 V
- PSYC 2001 B
- PSYC 2002 B
- PSYC 2002 C
- PSYC 2002 D
- PSYC 2002 E
- PSYC 2002 V

Duration: 30

Percentage: .5 Percentage

Appendix F

Manipulation Check Informed Consent Form

The purpose of an informed consent is to ensure that you understand the purpose of the study and the nature of your involvement. The informed consent must provide sufficient information such that you have the opportunity to determine whether you wish to participate in the study.

Study Title: The verification of stimuli for examining stereotype effects on shooting decisions

Faculty Sponsor: Dr. Craig Bennell

Phone: 520.2600 ex. 1769 EMAIL: craig_bennell@carleton.ca

Principle Investigator: Sarah Harmer EMAIL: sharmer@connect.carleton.ca

If you have any ethical concerns about how this study is conducted, please contact Dr. Monique Senechal (Chair of the Carleton University Research Ethics Committee for Psychological Research, 520-2600 x. 1155) or Dr. Anne Bowker (Chair of the Department of Psychology at Carleton University, 520-2600 x. 8218).

Purpose and Task Requirements: The aim of the present study is to check the study stimuli that can be used to identify factors that influence shooting decisions and subsequently develop training strategies to help individuals make more accurate decisions. We will ask you to judge various images presented to you on a computer and record your responses with pen and paper. This task should take you approximately 30 minutes.

Potential risk/discomfort. You will be presented with images of mock-handguns and everyday items (a cell phone and wallet), you should be aware that there is no risk to your safety, as all weapons presented are fake. If you feel any physical discomfort from sitting or looking at the computer monitor, you may take a break at any point. If you do feel uncomfortable at any point please tell the research assistant.

Right to withdraw and confidentiality. Your participation in this study is entirely voluntary. At any point during the study you have the right to withdraw and there will be no penalty whatsoever. Your name will never be associated with any of your responses.

I have read the above description of the study entitled “The verification of stimuli for examining stereotype effects on shooting decisions”. The data collected will be used for research and/or teaching purposes. My signature indicates that I agree to participate in the study, and this in no way constitutes a waiver of my rights.

Full Name (please print): _____

Participant Signature: _____

Date: _____

Researcher Signature: _____

Date: _____

Appendix G

Manipulation Check Debriefing Form

We would like to thank you for participating in this research. Your time and efforts are greatly appreciated! This post-session information is designed to help you understand the exact nature of this research.

Our current research program involves: (1) identifying factors (e.g., suspect ethnicity) that influence shooting decisions (amongst university students and police officers) and (2) developing training strategies to minimize the impact of these factors. The photos of you will act as stimuli in subsequent phases of this research. Participants will be shown these photos on a computer and will be asked to make split-second decisions as to whether or not they are looking at a threatening scene (e.g., handgun present) or a non-threatening scene (e.g., a cell phone present). The participants will have to choose either to shoot the target or not shoot depending on whether the suspect is armed (by pressing separate computer keys). By measuring decision outcomes and reaction times, the computer program will be used to identify which factors results in participants making accurate/inaccurate decisions. Based on previous research, we expect that university students will make shooting decisions that are consistent with danger stereotypes (e.g., that certain races are more dangerous than White people). For example, we are predicting that students will be more likely to shoot unarmed Aboriginal suspects compared to unarmed white suspects. Based on previous research, it is less clear that shooting biases will exist amongst police officers.

Once we determine if irrelevant clues, such as suspect ethnicity, influence shooting decisions, the next phase of our research program will be to examine different training strategies to see if we can minimize the extent to which participants focus on irrelevant cues when making shooting decisions and maximize their use of relevant cues (e.g., the presence/absence of a weapon). This research program has important theoretical implications. For example, we will learn whether stereotypes about various racial groups translate into biased behaviour in a setting where the stakes can be very high (e.g., shooting scenarios). In addition, we will learn about ways that people can control their responses to stereotypes so that inappropriate decisions are not made. In practical terms, the research is also very important. For example, the studies we conduct have the potential to inform use of force training programs, allowing police officers to receive higher quality training than is currently the case. Better training should result in more justifiable shooting decisions, which will ultimately enhance public safety.

To learn more about this research, you can read the following articles:

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

Correll, J., Park, B., Judd, C.H., Wittenbrink, B., Sadler, M.S., & Keesee, T. (2007). Across the thin blue line: Police officers and racial bias in the decision to shoot. *Journal of Personality and*

Social Psychology, 92, 1006 – 1023.

If you have any question or comments about this research, then please feel free to contact Dr. Craig Bennell (520-2600 x. 1569). If you have any ethical concerns about how this study was conducted please contact Dr. Monique Senechal (Chair of the Carleton University Research Ethics Committee for Psychological Research, 520-2600 x. 1155) or Dr. Anne Bowker (Chair of the Department of Psychology at Carleton University, 520-2600 x. 8218). If you are upset or anxious after completions of this study, please contact Carleton University's Health and Counseling Services (613-520-6674).

Appendix H

Recruitment Announcement

Study Name: Assessing Simulated Shooting Decisions

Purpose: The purpose of this study is to test a computer videogame that examines a person's accuracy in shooting decisions.

Description: You will be exposed to a task on a computer where you will be asked to make shoot/don't shoot decisions based on the image you see. Please note that it is possible that the scenes you encounter may be disturbing to view and that you may be uncomfortable making shooting decisions. In order to participate in this study you should feel comfortable viewing these images and making these decisions.

Sign-Up Restrictions: Must NOT have signed up or completed ANY of these studies:

- A Police Officer's Shooting Intention
- An Examination of Police Officer Shooting Decisions
- An Examination of Stimuli used to make Police Officer Shooting Decisions
- Beliefs Related to Police Use of Force Encounters
- Examining the Effect of Variable Use of Force Decision Thresholds.
- Police Officer Shooting Decisions: An Examination of When to Use Force
- A Study Examining Shooting Decisions

Course Restrictions: Participants must be in at least one of these courses:

- PSYC 1001 B
- PSYC 1001 I
- PSYC 1002 B
- PSYC 1002 C
- PSYC 1002 D
- PSYC 1002 E
- PSYC 1002 F
- PSYC 1002 G
- PSYC 1002 H
- PSYC 1002 P
- PSYC 1002 Q
- PSYC 1002 V
- PSYC 2001 B
- PSYC 2002 B
- PSYC 2002 C
- PSYC 2002 D
- PSYC 2002 E
- PSYC 2002 V

Duration: 30 minutes

Percentage: 0.5 Percentage

Appendix I

Adjectives Checklist⁶

Instructions: Please select the adjectives that you feel best describe the *cultural stereotypes* surrounding Aboriginal/White/Black/Middle Eastern/East Asian people. In other words, when you think of other people, how do you think they perceive Aboriginal/White people? You may choose as many adjectives as you wish. Keep in mind that this is not a measure of your personal beliefs towards a specific racial group, but rather your views of existing cultural stereotypes.

- | | | |
|--------------------------------------|--------------------------------------|------------------------------------|
| <input type="checkbox"/> Trustworthy | <input type="checkbox"/> Comforting | <input type="checkbox"/> Brutal |
| <input type="checkbox"/> Criminal | <input type="checkbox"/> Considerate | <input type="checkbox"/> Dangerous |
| <input type="checkbox"/> Loving | <input type="checkbox"/> Nice | <input type="checkbox"/> Cruel |
| <input type="checkbox"/> Vicious | <input type="checkbox"/> Evil | <input type="checkbox"/> Bully |
| <input type="checkbox"/> Kind | <input type="checkbox"/> Sympathetic | <input type="checkbox"/> Safe |
| <input type="checkbox"/> Gentle | <input type="checkbox"/> Friendly | <input type="checkbox"/> Killer |
| <input type="checkbox"/> Attacker | <input type="checkbox"/> Violent | |

Instructions: Please select the adjectives that you feel best describe your own *personal beliefs* about Aboriginal/White/Black/Middle Eastern/East Asian people. You may choose as many adjectives as you wish.

- | | | |
|--------------------------------------|--------------------------------------|------------------------------------|
| <input type="checkbox"/> Trustworthy | <input type="checkbox"/> Comforting | <input type="checkbox"/> Brutal |
| <input type="checkbox"/> Criminal | <input type="checkbox"/> Considerate | <input type="checkbox"/> Dangerous |
| <input type="checkbox"/> Loving | <input type="checkbox"/> Nice | <input type="checkbox"/> Cruel |
| <input type="checkbox"/> Vicious | <input type="checkbox"/> Evil | <input type="checkbox"/> Bully |
| <input type="checkbox"/> Kind | <input type="checkbox"/> Sympathetic | <input type="checkbox"/> Safe |
| <input type="checkbox"/> Gentle | <input type="checkbox"/> Friendly | <input type="checkbox"/> Killer |
| <input type="checkbox"/> Attacker | <input type="checkbox"/> Violent | |

⁶ The checklist was used 4 separate times for each racial group.

Appendix J

Motivation to Control Prejudiced Reactions Scale

1. In today's society it is important that one not be perceived as prejudiced in any manner.

1	2	3	4	5
Strongly Disagree				Strongly Agree

 2. I always express my thoughts and feelings, regardless of how controversial they might be.*

1	2	3	4	5
Strongly Disagree				Strongly Agree

 3. I get angry with myself when I have a thought or feeling that might be considered prejudiced.

1	2	3	4	5
Strongly Disagree				Strongly Agree

 4. If I were participating in a class discussion and visible minority student expressed an opinion with which I disagreed, I would be hesitant to express my own viewpoint.

1	2	3	4	5
Strongly Disagree				Strongly Agree

 5. Going through life worrying about whether you might offend someone is just more trouble than its worth.*

1	2	3	4	5
Strongly Disagree				Strongly Agree

 6. It's important to me that older people not think I'm prejudiced.

1	2	3	4	5
Strongly Disagree				Strongly Agree

 7. I feel it's important to behave according to society's standards.

1	2	3	4	5
Strongly Disagree				Strongly Agree

 8. I'm careful not to offend my friends, but I don't worry about offending people I don't know or don't like.
-

* Indicates that the item is reverse-scored, so that higher numbers would reflect a stronger motivation to control prejudice.

Appendix K

In-group Identification Questionnaire

Please indicate how much you agree with the statements below

(1= I strongly disagree 7=I strongly agree)

1. Being a member of my race/ethnicity is an important reflection of who I am
1 2 3 4 5 6 7
2. In general, being a member of my race/ethnicity is an important part of my self-image
1 2 3 4 5 6 7
3. I see myself as a member of my race/ethnicity
1 2 3 4 5 6 7
4. Being a member of my race/ethnicity is central to my sense of who I am
1 2 3 4 5 6 7
5. I value being a member of my race/ethnicity
1 2 3 4 5 6 7
6. Overall, being a member of my race/ethnicity has very little to do with how I feel about myself*
1 2 3 4 5 6 7
7. I feel proud to be a member of my race/ethnicity
1 2 3 4 5 6 7
8. Being a member of my race/ethnicity is unimportant to my sense of what kind of person I am *
1 2 3 4 5 6 7
9. I feel strong ties to other people of my race/ethnicity
1 2 3 4 5 6 7

Appendix L

Demographic Questionnaire

1. Current Age: _____

2. Gender:

- _____ Male
- _____ Female

3. Please check which group(s) to which you belong:

- _____ White
- _____ Black (e.g., African, Jamaican)
- _____ East Asian (e.g., Chinese, Japanese, Korean)
- _____ Middle Eastern (e.g., Iraqi, Egyptian)
- _____ South Asian (e.g., Indian, Pakistani)
- _____ Aboriginal (e.g., Métis, Cree)
- _____ Other (please specify): _____
- _____ Prefer not to answer

4. Please identify your highest level of education:

- _____ High School
- _____ Community college or CEGEP diploma
- _____ Bachelor's degree
- _____ Graduate or professional degree
- _____ Doctorate
- _____ Other (please specify): _____

5. If you are currently attending university, please identify the degree program in which you are currently enrolled (e.g., B.A. in Criminology, law clerk program, etc.):

_____.

6. If you are currently attending university, please identify your current level of study:

- _____ 1st year
- _____ 2nd year
- _____ 3rd year
- _____ 4th year
- _____ Other (please specify): _____.

7. Do you have any current or previous law enforcement experience?

- _____ Yes
- _____ No

Appendix M

Informed Consent Form

The purpose of an informed consent is to ensure that you understand the purpose of the study and the nature of your involvement. The informed consent must provide sufficient information such that you have the opportunity to determine whether you wish to participate in the study.

Study Title: Factors associated with shooting decisions

Faculty Sponsor: Dr. Craig Bennell Phone:520-2600.1769 EMAIL: craig_bennell@carleton.ca

Principal Investigator: Sarah Harmer EMAIL: sharmer@connect.carleton.ca

If you have any ethical concerns about how this study is conducted, please contact Dr. Monique Sénéchal (Chair of the Carleton University Ethics Committee for Psychological Research, 520-2600, ext. 1155) or Dr. Janet Mantler (Chair of the Department of Psychology at Carleton University, 520-2600, ext. 4173).

Purpose and Task requirements: The aim of the present study is to identify factors that influence shooting behaviour. You will be exposed to an experimental task on a computer where you will be asked to make shoot/don't shoot decisions based on whether or not you encounter an armed or unarmed target. Depending on your performance on this task, you may be eligible to win a monetary reward. After you have completed the experimental task, you will be asked to complete a range of computerized questionnaires. The entire process should take no longer than 30 minutes.

Potential risk/discomfort. You will be viewing scenes where a target may be holding a mock-handgun and you will be asked to make shoot/don't shoot decisions. It is possible that these scenes may be disturbing to view and that you may be uncomfortable making shooting decisions. We would like to stress that all of the stimuli that you view have been created for the purpose of this study and that none of the weapons used in these photos are real. However, in order to participate in this study you should feel comfortable viewing these images and making these decisions.

Right to withdraw and confidentiality. Your participation in this study is entirely voluntary. At any point during the study you have the right to withdraw and there will be no penalty whatsoever. The data collected in this experiment are confidential. None of the questionnaire or shooting data will be identifiable and it will not be used for research and/or teaching purposes.

I have read the above description of the study entitled "Factors associated with shooting decisions". The data collected will be used for research and/or teaching purposes. Clicking on continue below indicates that I agree to participate in the study, and this in no way constitutes a waiver of my rights.

Appendix N

Debriefing Form

We would like to thank you for participating in this study. Your time and efforts are greatly appreciated! This post-session information is to help you understand the nature of this research.

The current study is an attempt to determine whether target race influences shooting decisions. You were shown photos of armed and unarmed suspects of various races and were asked to make split-second decisions as to whether or not you would shoot the suspect. Previous research has found that participants often rely on pre-existing racial stereotypes to make shoot/don't shoot decision (e.g., that Black individuals are more dangerous than White individuals) even though target race is not related to the dangerousness of a situation. This can result in inaccurate decision making. For example, in previous studies, community members have been shown to be more likely to shoot unarmed Black suspects compared to unarmed White suspects.

To determine whether your attitudes towards people of different races relates to your shooting performance, you completed a range of explicit and implicit attitude measures, as well as a measure of your desire to control prejudice. Explicit attitude measures simply ask you to report your views.

This research program has important theoretical implications. For example, we will learn whether stereotypes about certain racial groups translate into biased behaviour in settings where the stakes can be very high (i.e., shooting scenarios). In addition, we will learn about ways that people can control their responses to stereotypes so that inappropriate decisions are not made. This research also has practical value. For example, the studies we conduct have the potential to inform use of force training programs, allowing police officers to receive higher quality training. Better training should result in more justifiable shooting decisions, which will ultimately enhance public safety.

To learn more about this research, you can read the following articles:

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Correll, J., Park, B., Judd, C. M., Wittenbrink, B., Sadler, M. S., & Keesee, T. (2007). Across the thin blue line: Police officers and racial bias in the decision to shoot. *Journal of Personality and Social Psychology*, 92, 1006-1023.

If you have any questions or comments, please feel free to contact Dr. Craig Bennell (520-2600 x. 1769). If you have any ethical concerns about this study, please contact Dr. Monique Sénéchal (Chair of the Carleton University Ethics Committee for Psychological Research, 520-2600 x. 1155) or Dr. Janet Mantler (Chair of the Department of Psychology at Carleton University, 520-2600 x. 4173). If you are anxious after this study, please contact Carleton University's Health and Counseling Services (613-520-6674).