Jumping the gun? An investigation of racial bias in the decisions to shoot

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ABSTRACT

Widely reported cases of police shootings of unarmed men from ethnic minority groups, have emphasised the significance of understanding erroneous shoot decisions. Extensive work over the past decade has demonstrated how race can bias perceptions and responses to threat. The 'shooter bias' paradigm was developed to examine the effects of a target's race on the decisions to shoot. Previous research has shown that individuals are quicker and more accurate to shoot armed Black/Middle-Easterner targets than Whites targets. This was supported by the notion that automatic shortcuts in cognitive processing mark associations of a stereotypical nature. However, previous research neglected to account for and control important contributors which influence shooting behaviours. Therefore, the present study re-examined the relationship between racial stereotypes towards Middle-Easterners in decisions to shoot. The framework used was a 'shooter task' which captured the shooting behaviours of eighty-four participants, to distinguish the shooter bias between White/Middle-Eastern targets, holding weapons/no-weapons, wearing turbans/balaclavas/no-headgear. Priming was used to promote stereotypes by linking the appropriate headgear with a relevant terrorist group (i.e. Al-Qaeda or Irish Republican Army (IRA)). As predicted, a weapon bias was evident, as participants made more accurate shoot decisions when weapons were present than when weapons were absent. Participants were also observed to be faster and more accurate in their decisions to shoot armed targets. However, the results showed no effect of race, headgear or priming on the accuracy of shoot decisions, as accurate shoot decisions were equally distributed across target race, headgear and terrorist-prime conditions. These findings did not support past work, as stereotypically driven racial biases in the decisions to shoot were not detected.

KEYWORDS:	SHOOTER BIAS	RACE	STEREOTYPIC PROCESSING	TERRORIST HEADGEAR	PRIMING

Introduction

In July 2005, during a period of terrorist attacks in London, a Brazilian man called Jean Charles de Menezes was misidentified as an Al-Qaeda terrorist and shot seven times by the Metropolitan police (Crown Prosecution Service, 2006). Previously, in September 1999, two armed law-enforcement officers in London challenged and killed Harry Stanley after he was incorrectly identified as an Irish terrorist carrying a shotgun (Independent Police Complaints Commission, 2006).

Unfortunately, these incidents do not represent an isolated pattern of erroneous shoot decisions made by law-enforcement officers. In February 1999,four law-enforcement officers in the United States mistakenly identified a West-African immigrant,AmadouDiallo, as a rape suspect. When the officers challenged Diallo in a New York neighbourhood, they mistakenly believed he was reaching for a shotgun in his jacket and proceeded to shoot 19 times (Ayoob, 2000).

Internationally, police shootings of unarmed men from ethnic minority groups have fuelled speculations of racism and sparked protests within communities (Correll, Wittenbrink, Park, Judd &Goyle, 2011). This phenomenon has come to the attention of many psychologists who question whether these outcomes occur due to officers' genuine misidentification of a weapon/threat or rather errors of automatic stereotypes associated with the suspects' race.

Social psychologists havelong been interested in the ways social categories, including race, can guide interpretations and reactions towards ambiguous stimuli (Duncan, 1976; Hilton & von Hippel, 1990; Jacobs &Eccles, 1992; Mitchell &Flin, 2007; Rothbart&Birrell, 1977; Sagar& Schofield, 1980). Much human behaviourcontains both controlled and automatic processes (Chaiken& Trope, 1999; Devine, 1989; Hassin, Bargh&Uleman, 2002;Scheneider&Shiffrin, 1977). The distinctions between these two processes have occupied a central role in social psychology research, reflected in theories of prejudice, stereotypes (Devine, 1989) and perception (Chaiken& Trope, 1999).

In essence, automatic processes build associations which organise social environments, allowing individuals to categorise and perceive their outside world in a simplistic manner (Chaiken& Trope, 1999). This can include the categorisation ofambiguous individuals into social groups. However, simplifying social environments can result in stereotyping. Stereotypes represent distinct cognitive structures which contain information about particular social groups.Consequently, individuals are judged if they are perceived to hold attributes belonging to a particular social group (Chaiken& Trope, 1999). Therefore, automatic associations potentially activate stereotypes of particular social groups, such as race.

According to Scheneider and Shiffrin (1977), automatic processes are effortless and can be activated in the presence of a triggering stimulus. Controlled processes,however, areregulated by temporary cognitive resources needed to complete specific tasks, assuch processes can be easily applied, altered and terminated (Smith &DeCoster, 2000; Strack& Deutsch, 2004). The influences of automatic and controlled processes are commonly separated into explicit and implicit measures. This approach has led psychologists to largely associate implicit measures with automatic processing (Fazio, Jackson, Dunton& Williams, 1995;

Greenwald, McGhee & Schwartz, 1998) and explicit measure with controlled processing (McConahay, 1986).

While some scholars have questioned the automatisation of stereotypes (Blair, 2002; Dasgupta& Greenwald, 2001; Lowery, Hardin & Sinclair, 2001), others have presented a wealth of evidence to demonstrate the activation of stereotypes outside the conscious control (Blair, Judd&Fallman, 2004; Correll, Park, Judd&Wittenbrink, 2002;Correll, Urland& Ito, 2005; Lambertet al., 2003). Devine (1989) argued that stereotypes can occur outside of conscious awareness. This was demonstrated by asking participants to rate targets' ambiguously hostile behaviour, after subliminally priming them with words related to both the social category and the stereotype of African-Americans. Participants who were primed with a greater number of stereotypical words were more likely to interpret the behaviour as hostile;regardless of whether the target's race was mentioned. Thus, associations between race and the concept of violence can lead individuals to automatically interpret ambiguous targets as more dangerous.

In particular, research has begun to investigate the ways in which race and racial stereotypes influence threat detection (Correll et al., 2002; Correll et al., 2007a; Payne, 2001; Payne, Shimizu& Jacoby, 2003; Unkelbach**,** Forgas& Denson, 2008). Payne (2001) examined the relationship between race and weapon identification. Participants were shown computer images of White/Black faces, followed by images of weapons/no-weapons. Participants were required to indicate the presence/absence of the weapon. Results revealed that weapons were identified significantly faster when participants were primed by Black-faces compared to White-faces. Payne (2001) concluded thatBlack targetsfacilitated greater weapon identification than White.

Moreover, Payne (2001) used congruent and incongruent pairing to explain these findings. According to this approach Black-faces followed by weapons signified congruent pairing. Incongruent pairing was signified through White-faces followed by weapons and Black-faces followed by no-weapons. The effects of the congruentcondition were more efficient as it allowed the use of either automatic or controlled processes to makecorrect decisions. The incongruentcondition forced participants to rely more on controlled processes. For example, controlled responses made for incongruent pairing reflected more accurate decisions which took longer to make. However, automatic responses made after incongruent pairing reflected the stereotypical associations (i.e. Black and gun) activated.

Payne (2001), further reported when reaction time was limited within 500 milliseconds (ms), incorrect responses significantly increased. As participants' made more stereotypically-congruent error responses, they misidentified no-weapons for weapons more frequently when primed with Black rather than White faces. Yet again the results identified a stereotypical association between Black individuals and weapons.

This apparent racial bias was further investigated by Correll et al. (2002) who developed the 'shooter bias' paradigm. This paradigmfacilitated an examination of the effect of target ethnicity on the decision to shoot, in a stimulated computer task. The task consisted of full body images of African-American/Caucasian targets, superimposed on various contextual backgrounds holding weapon/no-weapon.

Similar to the actions of law-enforcement officers, participants were instructed to ‘shoot’ armed targets and ‘not shoot’ unarmed targets by pressing one of two computer keys. A payoff matrix system rewarded participants points for correct hits (shooting an armed target) and correct rejections (not shooting an unarmed target), and deducted points for misses (not shooting an armed target) and false alarms (shooting an unarmed target).

It is important to note that race was unrelated to this task, as correct responses solely depended on the presence of the weapon. Nevertheless, shoot behaviours reflected racial and weapon biases, as participants were faster to shoot armed Black targets than armed White targets. Additionally, participants decided not to shoot unarmed White targets more quickly and frequently than unarmed Black targets,Correll et al. (2002) termed this pattern as a‘shooter bias’.

Since accuracy was relatively high, Correll et al. (2002) conducted a second experiment, limiting the reaction time within 630ms. As expected, this limited timeresulted in a significant increase in error rates. This effect was dependent on race, as participants incorrectly shot more unarmed Black targets and incorrectly failed to shoot more armed White targets. Results suggest accuracy increased when time was permitted to make a shoot/no-shoot decision as participants had more time to make controlled decisions. However, when response time was shortened, the ability to process the stimuli in a controlled manner was limited. Therefore, the increase in racial bias supported the notation that automatic decisions contain stereotypical judgments evident in behavioural errors.

The shooter bias paradigm is consistent with models of automatic processing, such as Conrey, Sherman, Gowronski, Hugernberg and Groom’s (2005) quadruple process model. This model suggests a stimulus (target race/weapon) may activate a given association (threat). The likelihood of this activation is thought to reflect the strength of the association (stereotype). Once activated, this association can hasten consistent behaviour (shoot response). So, when targets are armed, a biased response tendency and deliberative responses will prompt decisions to shoot.

Alternatively, stereotypical effects may be specific to particular populations. The aforementioned case studies emphasised how law-enforcement officers are not exempt to the shooter bias phenomenon. Correll et al. (2007a) investigated the seriousness of stereotypical responses within law-enforcement officers and civilians from the USA. Results showed more accurate weapon detection for law-enforcement officers than civilians. Specifically, officers more accurately identified armed Black targets than armed White targets. Again, when responses were restricted to 630ms, overall accuracy decreased as shoot responses increased. Civilians showed a racial bias, as they were more accurate to shoot Black targetsthan White. Law-enforcement officers’ exhibited no racial bias in their accuracy to shoot. Additionally, with training, the accuracy to shoot increased; the amount of practice participants received in the task could have accounted for the decreased racial bias. This study provides evidence to suggest law-enforcement officers show significantly less racial bias in their decisions to shoot.

Plant and Peruche (2005) also tested law-enforcement officers for shooter bias. Officers received 630ms to respond to targets with weapons/no-weapons.Unlike Correll et al. (2007a), law-enforcement officers displayed a significant racial bias,

asofficers incorrectly shot more unarmed Black targets than unarmed White targets. Also, officers incorrectly failed to shoot more armed White targets than armed Black targets. However, it was suggested that with practice the officers were able to eliminate their racial bias, whereby accuracy increased. This meant that initial automatic responses shifted towards more controlled responses over the course of the trials. This notion was supported by MacLeod and Dunbar (1988) and Smith and Lerner (1986) who both found that with practice, rapid controlled processes become more efficient.

While much discrimination research has focused on the shooter bias of African-American/Whitetargets, recent research has found a shooter bias or 'turban effect' for Muslim targets (Unkelbach**,**Forgas& Denson, 2008). Terrorist attacks in countries including the USA, UK, Indonesia, and Spain have reflected a salient threat to Western societies. As a result, stereotypes of Muslims and Middle-Easterners as extremists have become pervasive in Western cultures (Das, Bushman, Bezemer, Kerkhof&Vermeulen, 2009; Horry& Wright, 2009). Unkelbach, Forgas and Denson (2008) proposed that negative attitudes towards Muslims would increase aggressive-tendencies to shoot. An adapted version of Correll et al. (2002) shooter task was used to manipulate the visual cues of Muslim targets. The targets consisted of standardised head-and-shoulder images of Caucasian/non-Caucasian females and males outfitted with white turbans/hijabs. These targets were shown with an uprising hand holding weapons/no-weapons. Based on the notion that Muslim headgear would function as an aggression-eliciting cue, participants were induced into happy, angry and neutral moods. Participants received the same instructions to shoot/no-shoot targets with weapons/no-weapons as in Correll et al. (2002); however responses were restricted to 800ms.

As predicted, the experiment found a significant shooter bias for Muslim targets. Participants shot more frequently at non-Caucasian targets wearing turbans than Caucasian targets without headgear. Unkelbach, Forgas and Denson (2008) termed this pattern as the 'turban effect'. More specifically, the bias to shoot was stronger for Muslim/non-Caucasian males than for non-Muslim/Caucasian females, which suggested shooter bias was target race and gender specific. The induced-mood results suggested angry participants generally increased their shooting responses towards all targets, whereas happy participants selectively shot more Muslim targets. This finding was inconsistent with the concept, that similar to a weapon (Berkowitz &LePage, 1967), a turban/hijab should act as an aggression-eliciting cue.

Although, this experiment successfully demonstrated a shooter bias for targets wearing turbans, the results failed to clarify whether this turban effect was due to negative stereotypes associated with Muslims or terrorists. Unkelbach, Forgas and Denson (2008) argued that the stereotypical-associations between race, headgear and terrorism have almost identical implications. However, this may not be the case. For instance, Unkelbach, Forgas and Denson (2008) used Islamic turbans to provide participants with visual cues of Muslim identity. However, this form of headgear is generally perceived as a highly salient symbol associated with Al-Qaeda terrorists such as Osama bin Laden. Thus, in this study the stereotypical-associations made between religion and threats were controlled.

Therefore, the current study was designed to continue with this line of inquiry to investigate the effect of target race on participants' decisions to shoot. Implicit

measures of automatic processes such as priming and Correll et al.'s (2002) 'shooter task' were adapted to distinguish the shooter bias between White/Middle-Eastern targets, holding weapons/no-weapons, wearing turbans/balaclavas/no-headgear. Participants received the same instructions used in Correll et al. (2002). Priming was used to separately test headgear bias. The aim of the priming was to promote stereotypes by linking the appropriate headgear with the relevant terrorist group. Thus, two separate priming articles were used to link turbans with Al-Qaeda terrorists and balaclavas with IRA terrorists. This was particularly important to understand if a salient cue such as headgear elicited the bias to shoot a particular race (Chaiken& Trope, 1999).

According to Devine (1989), the level of prejudice towards a social group determines which social category is prioritised. For instance,if a participant views a target as both 'man holding weapon'and 'Middle-Eastern man with turban', one category will override the other. Evidently, the level of prejudice tends to bias responses when combined with the salience of the targets' social category (Correll, Park, Judd &Wittenbrink, 2007b; Macrae, Bodenhausen& Milne, 1995; Unkelbach**,** Forgas & Denson, 2008). Therefore, priming stereotypes prior to the shooter task can affect the response bias. For instance, if participants with high levels of prior prejudice prioritise the 'Middle-Eastern man' over the 'man holding weapon' category, responses will reflect a racial bias over the presence of the weapon.

The existing literature strongly suggests that the interpretation of the target as dangerous, and the association between the decisions to shoot, will differ as a function of the target's race. In line with the findings on weapon bias (Correll et al., 2002), the first hypothesis stated 'participants will make more accurate shoot decisions when the weapon is present than when the weapon is absent'. Corresponding with the racial bias literature (Correll et al., 2002; Correll et al., 2007a;Unkelbach, Forgas& Denson, 2008), the second hypothesis stated'participants will make more accurate shoot decisions for White targets than Middle-Eastern targets'.

Previous research has suggested that priming affects shooter bias responses. Correll et al. (2007b) confirmed that race-based associations between Blacks and danger promoted bias in the decisions to shoot. Participants were primed with stereotypically-congruent/incongruent newspaper articles before conducting the shooter task used in prior research. As predicted, reading about Black criminals dramatically increased shooter bias. That is, in the stereotypically-congruent condition, participants significantly shot more unarmed Black targets than unarmed White targets. However, the stereotypically-incongruent condition produced no bias, whereby reading about a White criminal lead toequal amount of shoot responses across all unarmed targets. Evidently, priming and exposure to prior racial bias effects stereotype accessibility and increases the magnitude of the shooter bias. Thus, automatic activation can also occur under priming conditions.

Therefore, consistent with the aforementioned theory that priming dramatically increases shooter bias,the third hypothesis predicted a terrorist-prime bias as 'participants will make more inaccurate shoot decisions in the Al-Qaeda and IRA condition than in the control condition'. Further, the fourth hypothesis predicted a terrorist-prime and headgear bias as 'participants in the Al-Qaeda and IRA condition

will make more inaccurate shoot decisions for unarmed targets wearing turbans/ balaclavas than unarmed targets with no headgear'.

Other important factors such as in-group identification might potentially play a role in shooter bias (Kenworthy, Barden, Diamond& del Carmen, 2011). According to social identity theory (Tajfel, 1982), identification with a social group often produces noticeable in-group biases (more favourable evaluations of one's in-group) and out-group biases (less favourable evaluations of an out-group). Therefore, the biases that people hold can lead to negative behaviours toward out-group members (Gonsalkorale, Hippel, Sherman &Klauer, 2009). Kenworthy et al. (2011) used the shooter task to examinehow in-group identification would impactautomatic processes. The result showed White participants decisions to shoot Black, but not White targets, increased with in-group identifications. Therefore, the final hypothesis predicted an interactional participant and target race bias as 'White participants will make more inaccurate shoot decisions for unarmed Middle-Eastern targets than unarmed White targets'.

Method

Participants

Eighty-four students from the University of Portsmouth (43 females, 41 males; aged between 18-36 years, *M*=19.76,*SD*=2.58), were recruited, via the departmental Participant Pool. Participants mainly consisted of undergraduate students, although some postgraduates and staff also took part. Sixty-six (79%) participants identified themselves as White and eighteen (21%) as non-White (including 6 Chinese, 2 mixed (White and Black African/Caribbean), 4 Black British, 5 Asian British, 1 Middle-Eastern).

Design

The study design was a 2 (Target Race: White vs. Middle-Eastern) × 2 (Object Type: Weapon vs. Neutral) × 3 (Target Headgear: Turban vs. Balaclava vs. None) × 3 (Terrorist-Prime Condition: Al-Qaeda vs. IRA vs. control) mixed-model design. Participants were randomly allocated to one of three between-subjects Terrorist-Prime conditions, where they read about either an Al-Qaeda (*n*=29) or IRA (*n*=28) terrorist-related article or a neutral article (*n*=28). Three target properties were manipulated within-subjects: headgear, object type and race. The dependent variables were reaction rates(ms) to shoot/no-shoot decisions in the shooter task and the total number of accurate response scores.

Materials

Priming Articles

A priming procedure was applied with two terrorist-related articles and one control article. The aims of the two terrorist-related articles were to prime stereotypes that linked Al-Qaeda (Appendix 4) and IRA (Appendix 5) terrorists to the appropriate headgear. The two articles depicted an alleged terrorist attack in London which had

taken the lives of nine civilians. The perpetrator was reported by witnesses to be wearing a scarf/balaclava with an open face, covering his head and neck. The articles continued to explicitly state which terrorist group was responsible (i.e. Al-Qaeda/IRA) and their motives for the attack. In the control group participants received a neutral article which described cake baking(Appendix 6). Participants were randomly assigned to read one of these three terrorist-prime conditions.

Shooter Task and Targets

A simple shootertask (similar to the task used by Unkelback, Forgas & Denson, 2008) was created using Visual Basic (copyright University of Portsmouth, 2010) in which target stereotypicality for race (White/Middle-Eastern), headgear (turban/balaclava/none), object type (gun/phone) and background (park/shopping centre) were manipulated.

To manipulate the stereotypicality of the targets, 36 standardised head-and-shoulder shots of male inmates were extracted from the Florida Department of Correctional website (cf. Unkelback, Forgas & Denson, 2008; http://www.dc.state.fl.us). Half the targets were Caucasian (*n*=18) and classified as “White” by the website. Whilst, the other half where non-Caucasian (*n*=18) with darker skin, but classified as “non-Black” and “non-Asian”. As Middle-Easterners were not in the race categories provided by the website, Islamic names/surnames were used instead to find and select these targets. The selected pictures of inmates with neutral facial expressions served as targets in the task.

The appearance for each target was manipulated using Adobe Photoshop (CS5) to insert headgears, objects, and contextual backgrounds. Each target appeared in three separate headgears with each object (turban/phone, turban/gun, balaclava/phone, balaclava/gun, no-headgear/ phone, and no-headgear/gun). The resulting targets were then shown with an upheld right hand either holding a black gun (weaponpresent) or holding a phone (weaponabsent). Each target image was superimposed on two different contextual backgrounds (deserted park and busy shopping centre) to ensure no stimulus specific effects associated with the background context occurred.

In total, 216 target images were created for the purpose of the shooter task. The task began with thirty-six practice trials, with eighteen White and eighteen Middle-Eastern targets followed by 180 experimental trials. The 180 experimental trials broke down to the following: 90 Middle-Eastern target trials and 90 White targettrials. Similar to the original shooter bias task by Correll et al. (2002), the task showed an equal amount of each target race, as participants saw half of the trials with White targets and half of the trials with Middle-Eastern targets. Within each group of White and Middle-Eastern target trials, there were 45 weaponpresent trials and 45 weaponabsent trials.

In order to reduce confounding variables such as fatigue effect, the task was divided into four blocks of 45 experimental trials with three breaks. Each trial consisted of a fixation point, followed by a target photograph. Each photograph showed a target from one of the aforementioned races in a park/shopping centre, wearing a headgear/no-headgear, with an uprising right hand holding an object (see Figure 1 & 2). The targets were always presented on the bottom of a full computer screen.

However, to restrict participants from focusing on one area, the positions of the targets were adjusted either to the bottom left, middle or right corner of the screen.

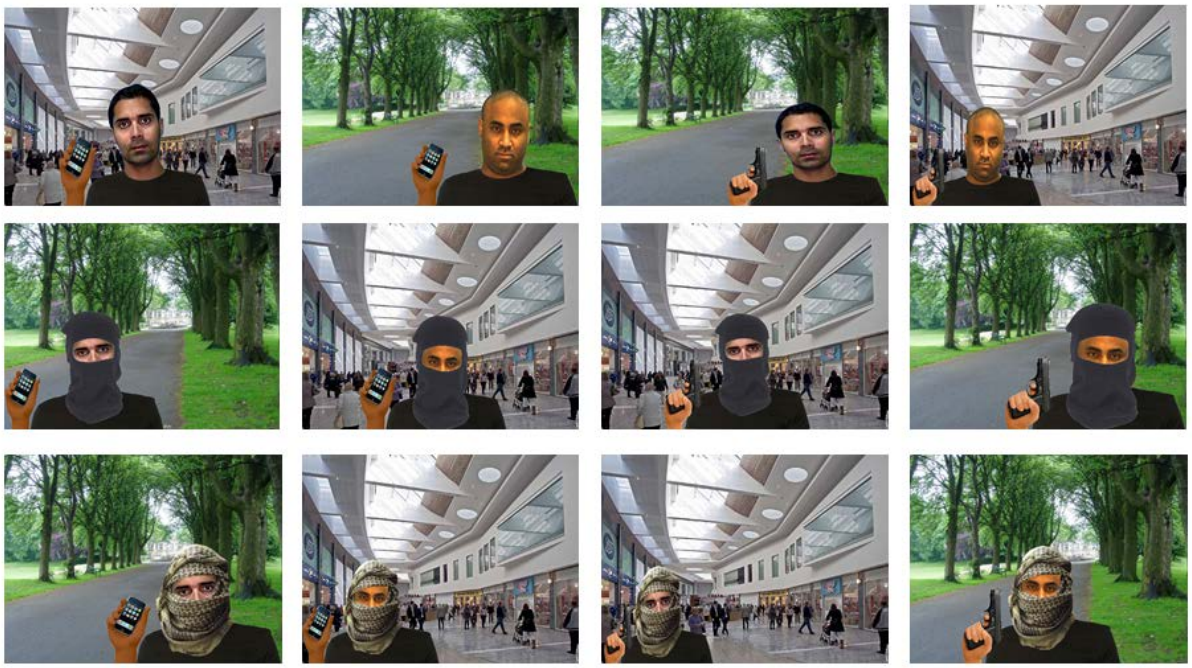

Figure 1: Examples of Middle-Eastern target trials used in the shooter task

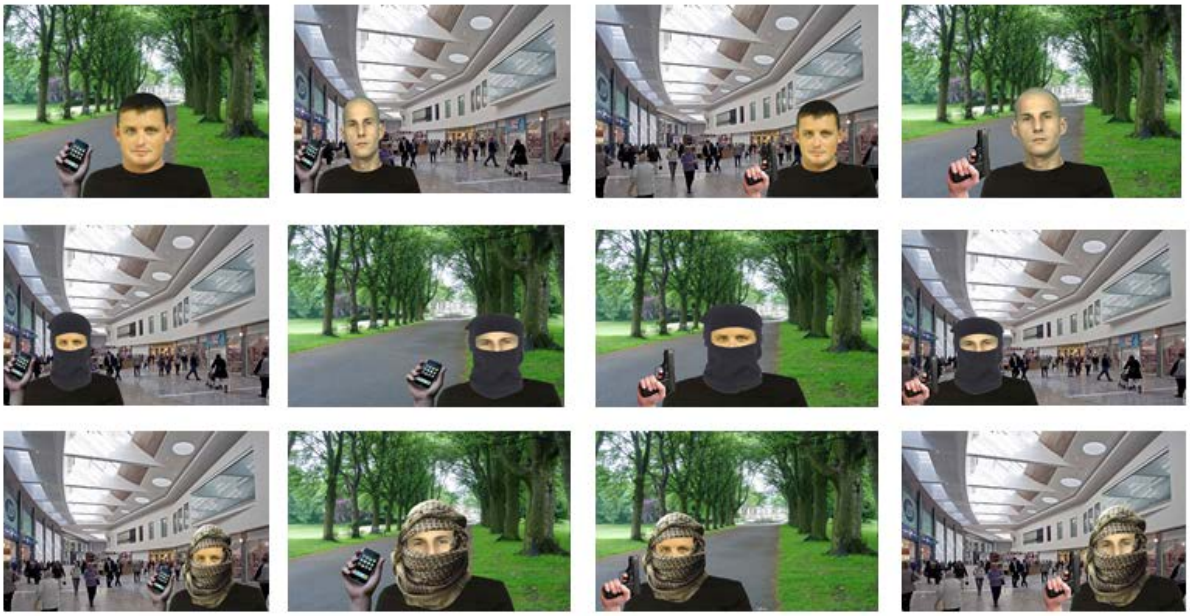

Figure 2: Examples of White targettrials used in the shooter task

Presentation order, position, and background location of the targets were randomised whilst the shooter task was running. The durations of each trial were fixed at 700ms. If participants failed to respond to a trial within this set time then that trial was terminated. In the case of a terminated trial, the shooter task programme automatically showed the trial again at the end, allowing participants to make a decision for all targets.

Participants had to decide, whether to ‘shoot’ or ‘not to shoot’ the presented target. Failure to respond within the time limit activated a short alarm, indicating to the participants that the trial was terminated, thereby they must respond faster. Due to the fast-paced nature of the shooter task, participants did not receive any other feedback on whether their decisions where correct or incorrect. Thus, during the shooter task participants were encouraged to remain focused.

Questionnaires

Three questionnaires were constructed, which served as manipulation checks. The first two questionnaires were created to measure how much information participants remembered about the newspaper article they read. These two questionnaires contained 10 questions, each related to the stories in the newspaper articles(Appendix 7). Neutral article readers completed a separate questionnaire; containing 10 questions(Appendix 8). Also, a further questionnaire was designed for completion by each participant, with 6 questions about the participant’s perception of the targets during the shooter task (Appendix 9).

Procedure

The experimenter introduced the study to participants as an investigation of perceptual vigilance and memory, specifically how much they could remember about a newspaper article. Once consent was gained (Appendix 1), participants completed a brief questionnaire (Appendix 3) which extracted demographic information.

Participants were then randomly allocated to one of the three terrorist-prime conditions. Participants read the newspaper article and were asked to remember as many details as possible, as their recall would be tested later in the study. Participants received 10 minutes to study the article, before they were required to complete a shooter task. Participants were told to remember the article in spite of the interference from the shooter task.

Before the shooter task, participants were instructed to take the role of an armed law-enforcement officer, and informed the task featured a number of targets with objects appearing at various positions on the computer screen. During the 700ms response window, their objective was to shoot at armed targets, but spare unarmed targets. As a law-enforcement officer their aim was to achieve the highest accurate performance in their unit. Participants selected a ‘shoot’ response by pressing the *Z*-key on the keyboard and the M-key for a ‘no shoot’ decision.

Upon conclusion of the task, participants were given two questionnaires. The first served as a memory test, asking questions about the article they read. The second questionnaire aimed to measure what participants remembered about the targets in the shooter task. Finally, participants were debriefed (Appendix 2), with particular attention to alleviating any negative feelings aroused in the individual by the task.

Results

Data Preparation

The experimental data were organised to show objecttypes (weaponpresent, weaponabsent), targetheadgear (turban, balaclava, none), targetrace (White, Middle-Eastern), participants reaction rates (ms) and response decisions (shoot, no shoot) for each terrorist-prime condition (Al-Qaeda, IRA, control).

Mean accurateresponse scores were calculated for each participant and targettype. This information was then used to determine the hit rate (H) and false alarm rate (FA) for target race and headgear. These measures were required to calculate the Signal Detection Theory (SDT) scores for sensitivity whered'=z(H)–z(FA)and threshold/decision criterion wherec=-0.5(z(H)+z(FA)).The response times (ms) were reorganised across target types to calculate participants' response latency means for correct and incorrect decisions.

Information obtained from the demographic questionnaires was used to link participants' gender, age, ethnic origin and religious belief to their shooter task data. The article recall questionnaires and theshooter task questionnairewere both used for checks of manipulation. Response on the article recall questionnaires provided information about participants' recall of tasks and allowed a manipulation check. Participants answered the majority of the recall questions correctly (M=8.04,SD=1.62).Responses on the shooter task recall questionnaire showed that the majority of participants correctly identified the target races (72%), target headgears (76%), and correctly reported the two objecttypes (100%).

Accurate Response Analysis

Accurate response scores served as the measurement of shooter bias. Accuracy was defined as correctly deciding to shoot an armed target or not-shoot an unarmed target. The accurateresponse scores for each targettype were analysed in a 2 (Target Race: White vs. Middle-Eastern) × 2 (Object Type: Weapon vs. Neutral) × 3 (Target Headgear: Turban vs. Balaclava vs. None) × 3 (Terrorist-Prime Condition: Al-Qaeda vs. IRA vs. control) mixed-model Analysis of Variance (ANOVA), with Terrorist-Prime Condition as a between-subject factor, and Target Race, Object Type and Target Headgear as the within-subject factors(Appendix 10). The main effect of Target Headgear was not significant, $F(2,162)=1.10$,$p=.336$,$\eta^2=.01$. This suggests target headgear did not affect the accuracy of the participants' decisions. Therefore, the analysis was run again excluding the Target Headgear factor (Appendix 11).

The resulting means (M) and standard deviations (SD) for the three-way mixed ANOVA appear in Table 1. The effect for Terrorist-Prime Condition was not significant $F(2,81)=0.73$,$p=.486$,$\eta^2=.02$. This suggests that reading newspaper articles about terrorist attacks did not prime stereotypes and showed no effect of racial bias on participants' accurate responsescores.

Table 1

Means and SD for accurate response scores as a function of Target Race, Object Type, and Terrorist-Prime Condition

	Al-Qaeda Condition		IRA Condition		Control Condition	
	M	*SD*	*M*	*SD*	*M*	*SD*
White Targets						
Weapon Present	0.95	0.03	0.95	0.04	0.95	0.04
Weapon Absent	0.92	0.05	0.91	0.06	0.89	0.17
Middle-Eastern Targets						
Weapon Present	0.96	0.03	0.94	0.05	0.94	0.06
Weapon Absent	0.93	0.05	0.93	0.06	0.91	0.16

However, there was a significant main effect of Object Type, $F(1,81)=10.67, p<.01, \eta^2=.12$. This suggeststhat participants were more likely to correctly shoot an armed target (hit) than to correctly choose not to shoot an unarmed target (correct response). The interaction effect between Target Race and Object Type (i.e. shooter bias) was also significant, $F(1,81)=6.64, p=.012, \eta^2=.08$. This suggests that participants were more accurate in their decisions to shoot when the weapon was present than in their decisions not to shoot when the weapon was absent across White and Middle-Eastern targets (see Figure 3.). However, the magnitude of the bias did not differ between Target Race, $F(1,81)=2.24, p=.138, \eta^2=.03$.

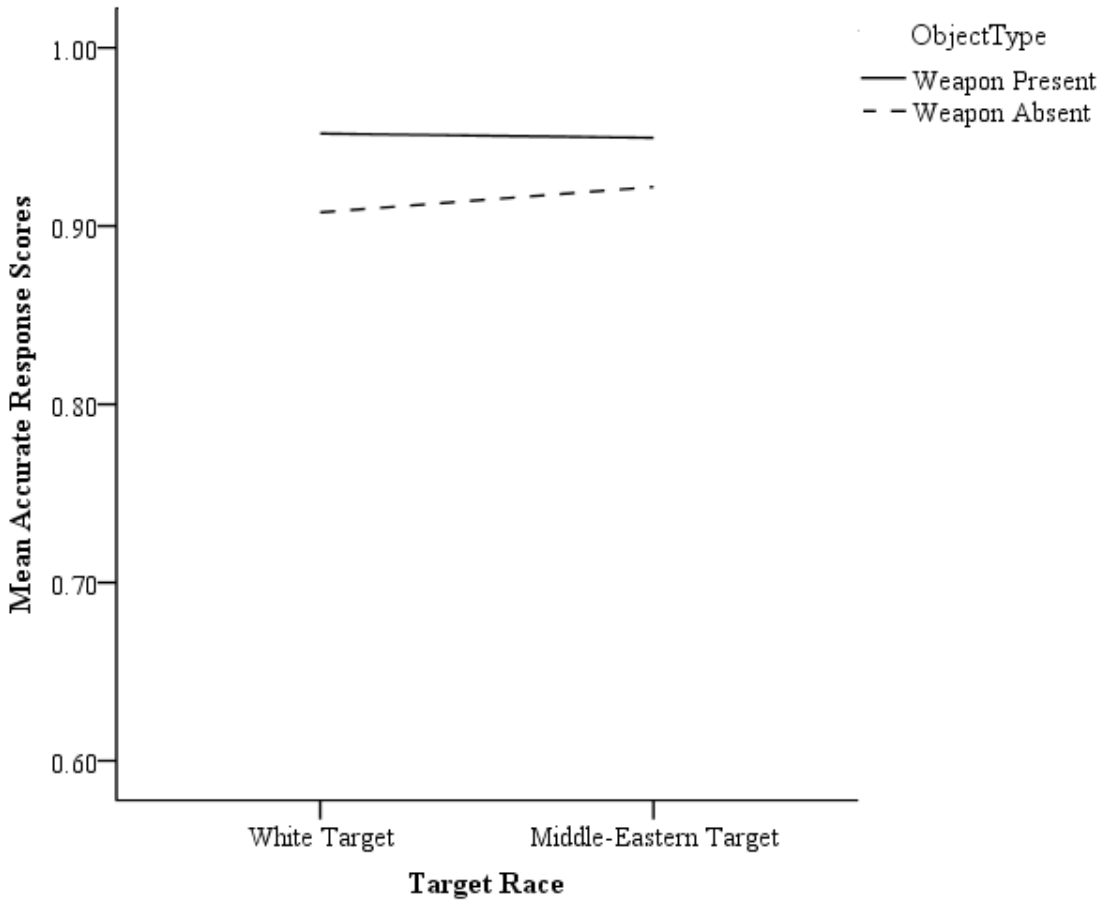

Figure 3: Mean accurate response scores as a function of Target Race and Object Type

To analyse the effect of the participants' race acrossaccurate response scores, participants' race were collapsed into two groups, labelled White and non-White. The accurate response scores, together with the participants' race were analysed in a 2 (Target Race: White vs. Middle-Eastern) × 2 (Object Type: Weapon vs. Neutral) × 2 (Participant Race: White vs. non-White) mixed-model ANOVA, with Participant Race as a between-subject factor, and Target Race and Object Type as the within-subject factors(Appendix 12). The resulting means and SD appear in Table 2.

Table 2

Means and SD for accurate response scores as a function of Target Race, Object Type, and Participant Race

	White Participants		Non-White Participants	
	M	*SD*	*M*	*SD*
White Targets				
Weapon Present	0.95	0.04	0.95	0.05
Weapon Absent	0.92	0.05	0.86	0.2
Middle-Eastern Targets				
Weapon Present	0.95	0.05	0.95	0.05
Weapon Absent	0.93	0.5	0.88	0.2

There was no main effect of Target Race, $F(1,82)=3.15, p = .080, \eta^2=.04$. A significant interaction effect of Target Race and Object Type was found, $F(1,82)=3.81, p=.054, \eta^2=.04$. This showed that accuracy significantly increased when the weapon was present, however when the weapon was absent accuracy decreased for both White and Middle-Eastern targets (see Figure 4.).

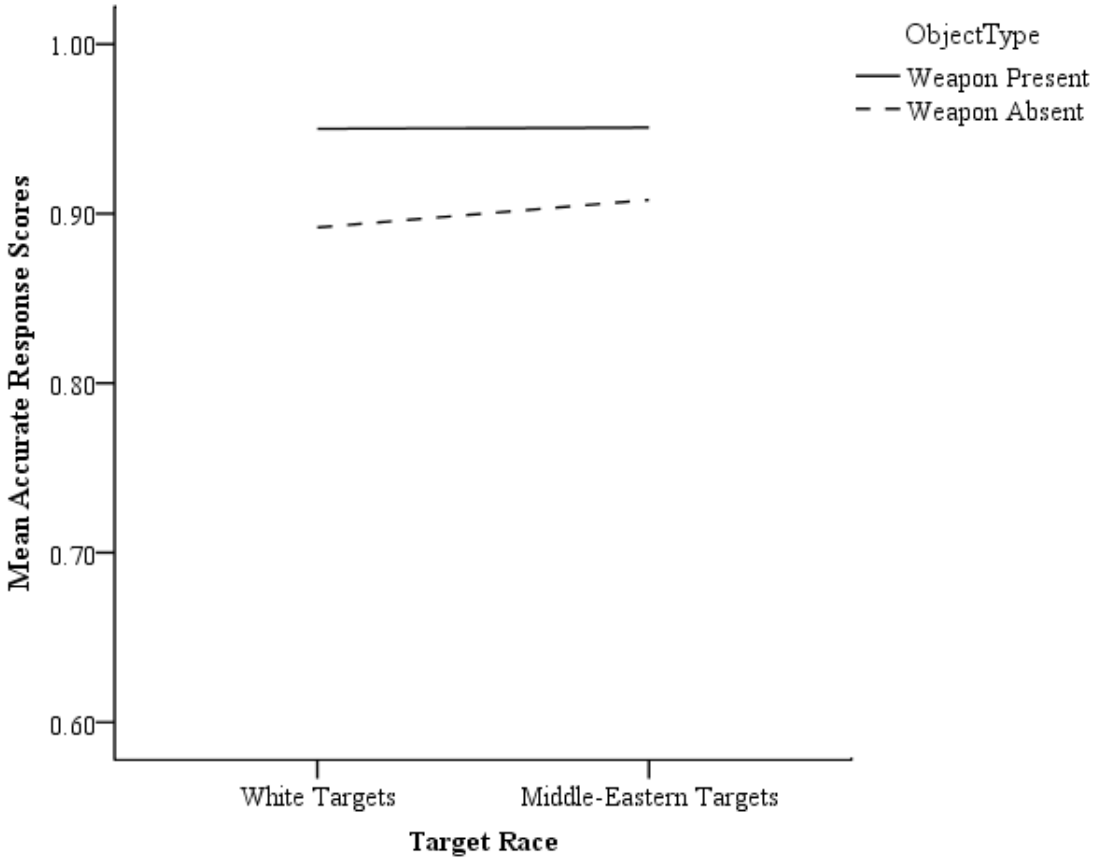

Figure 4: Mean accurate response scores as a function of Target Race and Object Type

There was no main effect for Participant Race, $F(1,82)=2.99, p=.087, \eta^2=.04$. This indicated that accuracy did not vary as a function of the participants'race. Although this analysis was non-significant, the means trended towards slightly more accurate response scores for White participants, when the weapon was present than when the weapon was absent across target race. Whereas, non-White participants were slightly less accurate when the weapon was absent compared to when the weapon was present across target race.

Signal Detection Theory Analysis

A SDT analysis offered a way to quantify and conceptualise the effects of target race and headgear in the shooter task by disentangling two distinct factors that could have influenced accurate response scores. First, SDT measures participants' ability to differentiate armed targets from unarmed targets. In the present analysis, this sensitivity was measured with the statistic, *d*'. Second, SDT estimates the degree to which participants favoured a 'shoot' response over a 'don't shoot' response. For instance, did they set a very low threshold (shoot often) for decisions to shoot or a very high threshold (rarely shoot)? This threshold/decision criterion was assessed with the statistic, *c*.

The analysis for sensitivity (*d*') was calculated six times for participants: White targets with no-headgear, Middle-Easterntargets with no-headgear, White targets with turban, Middle-Eastern targets with turban, White targets with balaclava, and

Middle-Easterntargets with balaclava. The sensitivity was then analysed as a function of Target Race and Target Headgear, submitting them to a two-way within-subjects ANOVA (Appendix 14). The resulting means and SD appear in Table 3.

There was no main effect for Target Race ($F(1,83)=2.26, p=.136$) or Target Headgear ($F(2,166)=1.38, p=.254$)on accurate response scores. There was no significant interaction effect for Target Race as a function of Target Headgear, $F(2,166)=0.58, p=.560$. This indicated that participants' ability to distinguish between White and Middle-Eastern targets was not compromised by the target headgear. That is, participants' accuracy to differentiate between the two races were similar across all three target headgears, thereby this did not affect the bias of accurate response scores.

Table 3

Means and SD for sensitivity d' as a function of Target Race and Target Headgear

	White Targets		Middle-Eastern Targets	
	M	*SD*	*M*	*SD*
No Headgear	2.91	0.68	2.92	0.60
Turban	2.80	0.70	2.92	0.74
Balaclava	2.79	0.69	2.87	0.05

Although no significant difference was found between target race and headgear, there seemed to be a trend in the means which might suggest that participants' were more sensitive towards White than Middle-Eastern targets with turbans and balaclavas; however this difference was not significant.

Estimates of decision criterion (*c*) were submitted to an identical two-way within-subject ANOVA (Appendix 15). The resulting means and SD appear in Table 4. There were no main effects of Target Headgear ($F(2,166)=0.14, p=.874$). Although there was no main effect of Target Race ($F(1, 83)=3.22, p=.077$), the data approached significance. A follow-up paired-samples t-test found a significant difference between the decision criterion for White and Middle-Eastern targets, $t(83)=-2.28, p =.025$. This suggests that there might have been a difference emerging, as participants' decision criterion was set at a more conservative level for Middle-Eastern targets than for White targets (see Table 4 for means). However, this interpretation should be approached with caution.

Table 4

Means and SD for decision criterion c as a function of Target Race and Target Headgear

	White Targets		Middle-Eastern Targets	
	M	*SD*	*M*	*SD*
No Headgear	-0.12	0.27	-0.09	0.27
Turban	-0.11	0.3	-0.75	0.31
Balaclava	-0.11	0.2	-0.07	0.23

The interaction of Target Headgear and Target Race was also non-significant for the decision criteria, $F(2,166)=0.07, p=.929$. This indicated that since the targets' race and headgear were not perceived to be salient cues for danger, the participants' adopted a more lenient criterion in their decisions to shoot.

Response Latency Analysis

Given an apparent trend towards a conservative decision criterion for Middle-Easterntargets, response latencies were analysed to examine whether decisions to shoot took longer for Middle-Eastern targets. The effects of accurateresponse scores for correct and incorrect decisions were tested on response latency rates (ms). Average log-transformed latencies from correct and incorrect trials were submitted to a 2 (Target Race: White vs. Middle-Eastern) × 2 (Object Type: Weapon vs. Neutral) × 2 (Response Accuracy: Correct vs. Incorrect) within-subject factors ANOVA (Appendix 13). The resulting means and SD appear in Table 5.

Table 5

Means and SD for response latency rates (ms) as a function of Target Race, Object Type, and Response Accuracy

	Correct Responses				Incorrect Responses			
	Weapon Present		Weapon Absent		Weapon Present		Weapon Absent	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
White Targets	427.94	26.32	430.22	29.12	427.02	69.36	405.1	60.82
Middle-Eastern Targets	425.82	26.71	427.61	28.97	411.36	62.95	406.6	47.71

There was no main effect of Target Race, $F(1,50)=1.39, p=.245, \eta^2=.03$. The interaction between Target Race and Response Accuracy was non-significant, $F(1,50)=0.31, p=.583, \eta^2=.01$. This suggests that participants' response latency rates did not differ for accurate scores across target race.

Yet, a significant interaction effect for Object Type and Response Accuracy was found, $F(1,50)=5.47, p=.023, \eta^2=.10$. The means revealed that participants were significantly faster at making incorrect decisions to shoot when the weapon was absent, than correct decisions to shoot when the weapon was present.

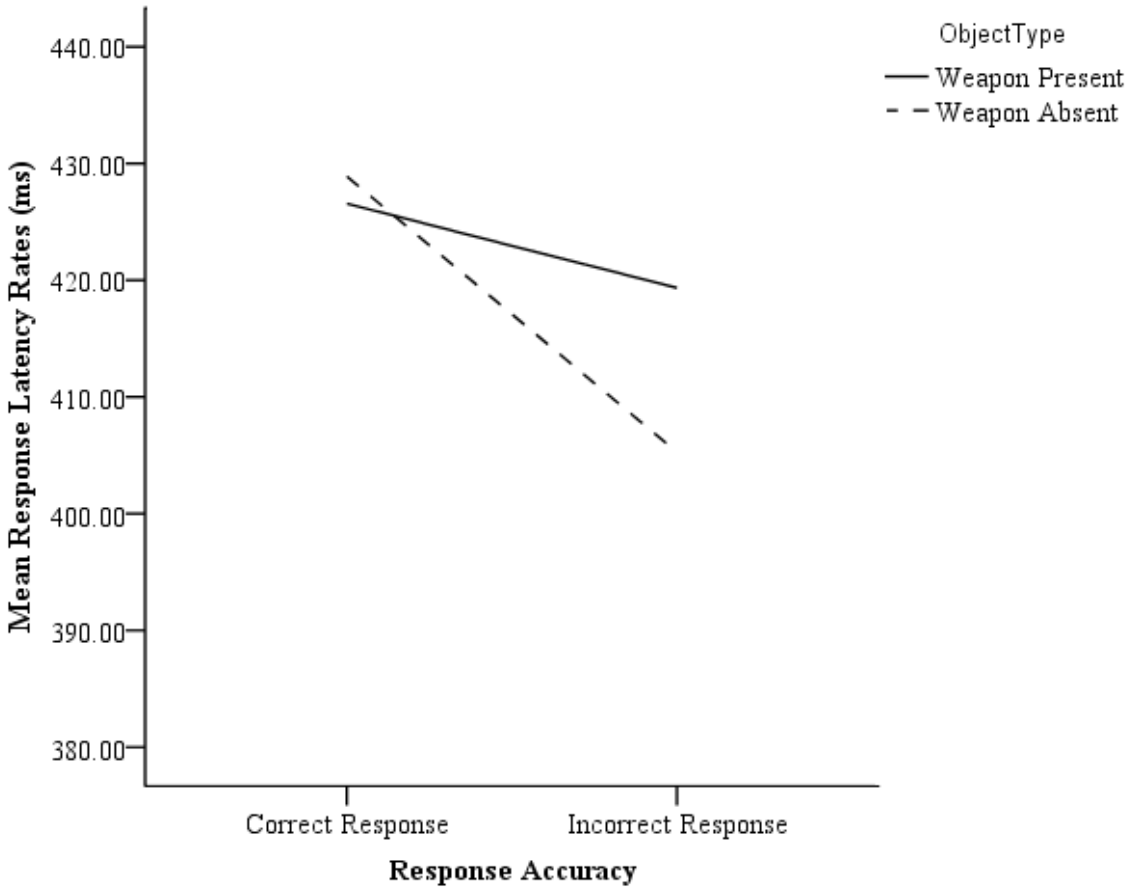

Figure 5: Mean response latency rates as a function of Object Type and Response Accuracy

Discussion

The current study examined for racial bias in shooting behaviours. Specifically, the shooter bias paradigm was used to manipulate and test the effect of race on decisions to shoot. The results observed a significant effect of weapon bias, that is, participants were more likely to make accurate shoot decisions when weapons were present than when weapons were absent. Therefore, the current data supported the hypothesisthat decisions to shoot will differ as a function of object type.

In the shooter bias paradigm studies conducted by Correll et al. (2002, 2007a),participants were observed to be faster and more accurate in their decisions to shoot armed targets. Also, participants were observed to be faster at not shooting unarmed White targets than unarmed Black targets (Correll et al., 2002). However, in the current study, response latency results revealed inaccurate shoot decisions were made more quickly than accurate shoot decision.

The current study found no main effects of race on the accuracy of shoot decisions, with accurate shoot decisions equally distributed across Middle-Eastern and White targets. Therefore, the hypothesis that participants would make more accurate shoot decisions for White targets than Middle-Eastern targets was rejected. Additionally, the response latency results showed no significant effect of accurate response scores and target race on response rates, as decision latency for both present and absent weapons were similar across race.

In contrast to the results obtained by previous priming research (Correll et al., 2007b), the current study found no main effects of terrorist-prime bias. Terrorist-related articles failed to prime stereotypes, as accuracy was maintained across conditions. Therefore, the hypothesis that participants would make more inaccurate shoot decisions in the Al-Qaeda and IRA condition than in the control condition was rejected.

Although previous research observed a turban effect linked to negative stereotypes associated with Muslims and subsequent bias in shoot decisions (Unkelbach**,** Forgas & Denson, 2008), the current study found no significant interaction effect of terrorist-prime and headgear bias. That is, terrorist-related articles failed to prime stereotypes of headgears to terrorist groups; thereby accuracy was maintained across headgear. Thus, the hypothesis that participants in the Al-Qaeda and IRA condition would make more inaccurate shoot decisions for unarmed targets wearing turbans/balaclavas than unarmed targets with no headgear was rejected.

Based on Kenworthy et al. (2011), it was also predicted that participants' in-group race would lead to out-group discrimination and more inaccurate shoot decisions towards Middle-Eastern targets. However, the results showed no main effect of the participants' race on accurate scores. Therefore, the hypothesis that White-participants would make more inaccurate shoot decisions for unarmed Middle-Eastern targets than for unarmed White targets was also rejected.

Previous studies, reported Black/Middle-Eastern targets increased bias, however the current results found the opposite; White targets were more likely to increase the bias. Evidently, the decision criterion data approached significance to suggest White targets were treated in a more hostile manner. However, the reduction in bias was due to the fact that participants were predisposed to shoot all targets, White and Middle-Eastern alike, in the presence of weapons. This behaviour suggests participants adopted a defensive orientation in the presence of sufficiently salient danger cue such as a gun. Thus, once danger was activated by the initial cue, additional cues such as target race and headgear had little incremental impact.

Correll et al. (2002) and Payne (2001) suggest controlled processes take longer to make, thus increase accuracy in response to race. Yet, the findings showed that response rates for correct and incorrect decisions in weapon present/absent trials

were the same across both White and Middle-Eastern targets. The participants were, however, significantly faster at making incorrect decisions to shoot when the weapon was absent. This supports Conrey et al.'s (2005) quadruple process model, whichsuggests that automatic processing is activated by making associations between the weapon and threat. This association consistently hastened incorrect shooting behaviours.

Overall, the results indicate the targets' race, technically irrelevant to the shooter task, did not interfere with the participants' ability to react appropriately to the object in hand. Also, the results indicated that regardless of target headgear and despite priming participants with terrorist-related information, the majority of participants accurately assessed when targets were unarmed and decided not to shoot. Unlike previous studies commonly observing stereotypical shooting behaviours to be fairly stable (Correll et al., 2002; 2007a; 2007b), the current findings did not support the notion of racial bias in shooting behaviours.

There are a number of possible explanations for the current null findings. For instance, it may be that individuals can moderate response bias if they have access to discriminatory cues (presence/absence of weapon) combined with the necessary cognitive capacity and motivation (Conrey et al., 2005). Thus, when suitable cues are available, individuals can override bias by executing more deliberate responses. Also given enough time, individuals who perceive Middle-Eastern targets to be unarmed can effectively refrain from using stereotypical shoot responses. Furthermore, participants may have applied bias-reduction strategies (Payne 2006) over the course of the trials in the shooter task. These strategies can consist of two approaches, whereby one can either attempt to change the automatic impulse or maximise behavioural control. There is evidence to suggest that practice in identifying race and weapons may have beneficial effects on both controlled and automatic components of responses (MacLeod & Dunbar, 1988; Plant &Peruche, 2005; Smith & Lerner, 1986).

Research has shown that although people cannot eliminate bias, certain specific strategies may be able to eradicate the automatic component of the bias. Stewart and Payne (2006) cited in Payne (2006) asked participants to form plans to connect specific counter-stereotypic thoughts with race categories (Gollwitzer, 1999). An example of the plan participants made was 'when I see a black face I will think 'safe''. Participants who formed plans displayed no automatic race bias, unlike those who tried to avoid bias. Collectively, these studies offer clues to understand how and why strategies may be successful/unsuccessful.

Executive controls may have determined the automaticity of bias expressed in the shooter task. The capacity to limitcertain thought processes and behaviours, to reach a goal-orientated task is defined as executive control; such as the shooter task (Payne, 2005). Payne (2005) examined the role of executive control in moderating automatic social biases and demonstrated that individuals with good executive control displayed similar levels of automatic stereotypes activated, compared to those with poor control. However, the activations of automatic stereotypes were less likely to be expressed in behavioural errors or social judgements among those with good executive control. It may be that the participants in the current study had high levels of executive control which reflected in highly accurate response scores.

Notably, the methodology used in the present research was not without limitations. Firstly, the shooter task may have been 'too easy', as suggested by the highly accurate response scores. The response limit (700ms) may provide participants with more time than necessary to make decisions about the targets. Secondly, the study did not control for 'gamers' in the sample, as the amount of hours participants spend on playing videogames may have contributed to high accuracy scores.

Thirdly, the shooter task may have produced practice effects. Correll et al. (2007a) and Plant and Peruche (2005) both suggested that practice effects reduced stereotypic processes and decreased shooter bias. The accuracy to shoot may have increased over the course of the trials, which might have accounted for the decrease in racial bias. Therefore with practice, automatic responses would have shifted to more accurate controlled responses (MacLeod & Dunbar, 1988; Smith & Lerner, 1986).

Another critical factor not examined was the environmental context in which the shooting decisions occurred, as the environmental contexts employed in the shooter task were neutral. Previously, stereotypically threatening environmental contexts have been shown to influence implicit stereotypes (Wittenbrink, Judd & Park, 2001). Thus, similar bias amplifications may have been found in the current shooter task as environmental contexts could prime race or impact threatening cues.

Finally, similar to Unkelbach**,** Forgas and Denson (2008), the current study waslimited to university students. Research has found that those with higher levels of education express less prejudice (Hello, Scheepers&Sleegers, 2006; Sullican&Transue, 1999). Therefore, it may be of importance to replicate the current study with participants from the general public, as they may pose greater stereotypical biases towards Middle-Easterners.

Despite these limitations, the methodology applied in the current study did nevertheless control for many potentially confounding variables. That is, a systematic approach was used in the shooter task: the stimuli were carefully controlled across independent variables such as race, object and headgear. Also, the number of experimental trials (180) was sufficientto detect any bias. Furthermore, the stimuli sought to disentangle race from terrorist stereotyping, unlike previous research, such as Unkelbach**,** Forgas and Denson (2008),where these factors were confounded. Yet, the results obtained were highly accurate, thus presenting no sign of racial bias on shoot decisions. Consequently, results of previous research must be treated with caution and a degree of scepticism.

Subsequently, limitation of research in shooter bias must be acknowledged. Previous designs have not fully recognised all the necessary factors likely toyield bias. Research has found strong racial biases, leading authors to make strong claims about racism (e.g. Correll et al., 2002; 2007a; 2007b; Payne, 2001; Plant &Peruche, 2005; Unkelbach**,** Forgas & Denson, 2008). However, these authors have failed to clarify that such racism cannot be generalised. For instance,racial bias observed in the shooter tasks may have been deeply rooted in the cultural context the experiments were conducted.

In Britain, prejudices against ethnic minorities have declined (Ford, 2008). Ford (2008) recommended three possible reasons for the decline and social distribution of

racial prejudice among White Britons. First, racial attitudes are strongly structured by a major generational shift. Individuals who have grown up since mass immigration express less prejudice. This generational process of eliminating prejudice was perhaps reflected in the current sample (aged between 18-36 years), as younger Britons are less likely to discriminate against non-White migrants. Secondly, the social distribution of racial prejudice has rapidly decreased between generations among the professional classes and highly educated individuals.

Finally, Ford (2008) found religious practices of British Asian communities to attract far less hostility from the White population. This has been linked to the rising level of White social contact with Asian Britons. Thus, as the minority populations have grown, ethnic minorities have socially and geographically dispersed (Simpson, 2007). Arguably, ethnic minorities have become an unquestioned part of the British community. Therefore unlike previous shooter bias research, which has failed to acknowledge cultural discrepancies of racial bias, the current research suggests exposure and responses to factors increasing or decreasing prejudice may be socially and culturally differentiated, resulting from attitudinal divergence.

Further limitations to studies of shooter bias can be ascribed to ecological factors, as unlike officers on the street, participants are fully aware that shooting a target causes no real harm. Therefore, the level of stress affecting decision making would be considerably less than in a real incident; where decisions to shoot hold far greater consequences. Hence, shooter bias studies profoundly change the nature of shoot/no-shoot decisions.

It would be important for future research to further explore whether racial bias would occur among those who make real life and death decisions, such as law-enforcement officers and military personnel, by using the design of the current study. This may ultimately provide a more comprehensive and effective understanding of how suspects'race affects police use of force. Accordingly, identifying racial bias within law-enforcement officers, with the methodology in the present study, deserves further investigation as research in this area is limited. It is of particular importance to challenge claims of racial bias amongst officers and assure citizens the society is not governed by biased state actors, especially citizens of minority status.

Further, an increasingly sophisticated and popular misconception is the idea that racism is usually associated with the treatment of other races by White individuals. However, racism has been demonstrated by all individuals, regardless of their ethnic backgrounds (Song, 2004). Future research might apply the shooter bias paradigm to examine Middle-Easterners shoot decisions when presented with potentially threatening/non-threatening White stimuli.

In conclusion, the current study suggested weapon detection played an important role on shooting behaviour. However, race was not accounted for in the accuracy of shoot decisions. In light of the current results, strong claims about racism from previous research should be approached with caution; as such claims have serious consequences for criminal justice personnel, in terms of repercussions and state-citizen relations.

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