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Quick to the draw: How suspect race and socioeconomic status influences shooting decisions

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Abstract

We examined the role of both suspect race and socioeconomic status (SES) on shooting decisions during a first-person shooter task. Two studies revealed that both suspect race and SES influenced shooting decisions. Non-Black participants shot armed high-SES Black suspects faster than armed high-SES White suspects and responded "don't shoot" faster for unarmed high-SES White suspects than unarmed high-SES Black suspects. No race differences appeared in the low-SES conditions—responses resembled high-SES Black suspect. Signal detection, misses, and false alarm analyses revealed participants erred toward not shooting high-SES White suspects. The current studies draw attention to considering both race and SES during shooting decisions.

1 | INTRODUCTION

In response to high profile cases in which White police officers shot unarmed Black men in the United States, researchers have developed computer simulations to examine the impact of race on shooting decisions (e.g., Correll, Park, Judd, & Wittenbrink, 2002; Plant & Peruche, 2005). Research using these simulations has found that biased associations linking Black people to both aggression and criminality may guide split-second shooting decisions such that people tend to be biased toward shooting Black compared to White suspects. Subsequent work using shooting simulations has demonstrated that other factors including suspect gender (Plant, Goplen, & Kunstman, 2011), clothing (Unkelbach, Forgas, & Denson, 2008; Unkelbach, Goldenberg, Müller, Sobbe, & Spannaus, 2009), and situational danger (Correll, Wittenbrink, Park, Judd, & Goyle, 2011) interact with race to influence decisions. The present work investigates socioeconomic status (SES), an important, previously unexamined social dimension that we hypothesize influences shooting decisions. Across two studies we explored the interplay between race and SES for split-second shooting decisions.

In the United States, there is a strong stereotypic association between Black people and violence/danger (e.g., Devine & Elliot, 1995; Quillian & Pager, 2001), which can lead to more threat-related responding toward Black than White people (e.g., Correll et al., 2002; Glaser & Knowles, 2008; Payne, 2001; Plant & Peruche, 2005; Wittenbrink, Judd, & Park, 1997). For example, Correll et al. (2002) administered a computer simulation task where participants responded "shoot" when presented with an armed suspect and "don't shoot" when presented with an unarmed suspect. Participants were faster to shoot armed Black than White suspects. Additionally, when participants were forced to make their decisions quickly, they were more likely to incorrectly shoot unarmed Black than White suspects. This effect has been replicated across multiple studies (e.g., Correll et al., 2002; Correll, Park, Judd, & Wittenbrink, 2007; Plant, Peruche, & Butz, 2005), and converging evidence across these studies indicates that stereotypes largely drive this effect (Correll et al., 2002; Correll, Urland, & Ito, 2006; Sadler, Correll, Park, & Judd, 2012).

Further evidence suggests that contextual threat cues beyond race might influence perceptions and judgments toward an individual (e.g., Feldman & Hilterman, 1974; Jussim, Coleman, & Lerch, 1987; Kirby, 1999; Terrill & Reisig, 2003; Westie, 1952). For instance, automatic social judgment research suggests the existence of an interaction between multiple factors about the target (e.g., race, social role, and the situational context) that lead to biased responding (e.g., Barden, Maddux, Petty, & Brewer, 2004; Yang, Huang, & Zhu, 2011)—a crucial finding when understanding how race and SES might interact to influence decision-making on a shooter task. In a study conducted by Barden and colleagues (2004), the researchers manipulated the race and social roles of the stimuli to examine controlled and automatic evaluations of White participants. The researchers found that stereotypes guided automatic evaluations of Blacks, Whites, and Asians when the targets were presented in different social contexts. When participants were shown pictures of Black, White, and Asian men on the basketball court, participants rated the Black individuals most favorably. Similarly, Asian men in classrooms were rated more favorably than White and Black men (Barden et al., 2004). In both situations, combined stereotypes regarding situational contexts and race influenced social attitudes

toward that individual. Likewise, the combination of both race and SES factors could together impact shooting responses.

Just as stereotypes connecting race to aggression/criminality exist, stereotypes linking poor people to violence and criminality also exist (Cozzarelli, Wilkinson, & Tagler, 2001). Negative traits such as untrustworthy, dishonesty, laziness, and incompetence are associated with the poor (Bullock, 1999; Fiske, Cuddy, Glick, & Xu, 2002; Spencer & Castano, 2007), causing poor people to be dehumanized and portrayed as animalistic (Loughnan, Haslam, Sutton, & Spencer, 2014). These stereotypes linking dishonesty and SES may influence split-second decisions to shoot in a similar manner as race. To examine this possibility, the present work investigated the joint effects of race and SES on shooting decisions toward suspects who varied in both race and SES (Black low-SES, Black high-SES, White low-SES, White high-SES).

There is reason to anticipate that race and SES together influence threat perceptions. Studies have demonstrated that the combination of race and SES lead to variations in stereotypes (Bayton, McAllister, & Hamer, 1956; Smedley & Bayton, 1978), racial categorization (Penner & Saperstein, 2008; Weeks & Lupfer, 2004), desired social distance (Westie, 1952; Westie & Howard, 1954), facial recognition (Shriver, Young, Hugenberg, Bernstein, & Lanter, 2008), and perceptions of others (Cole & Omari, 2003). For example, Shriver and colleagues (2008) demonstrated that context and race together influence facial recognition. That is, Whites demonstrate better recognition of White faces presented in rich contexts than in poor contexts, and recognition of White faces in impoverished settings is similar to recognition of Black faces in both impoverished and rich contexts. Thus, it is plausible that together race and SES will cause variations in threat-related shooting responses, especially in ways that are unique from race-specific responses.

Some research has indirectly examined the role of race and SES through contextual variations. Correll et al. (2011) demonstrated variations in shooting responses when Black and White suspects were placed in contexts that varied in apparent danger. The authors argued that "...any cue (i.e., not just race) that sufficiently activates the concept of danger should create a predisposition to shoot" (Correll et al., 2011, p. 185). Although any cue of danger should have a strong impact on the decision to shoot, they made the case that the addition of supplemental cues associated with danger should have relatively little effect. Consistent with their theorizing, Correll and colleagues found an interaction between context and race. Participants were more likely to shoot suspects, regardless of race, when the suspect was in a dangerous context (e.g., an alleyway). Yet in neutral or safe settings (e.g., a park), people were biased by race and tended toward shooting Black more than White suspects. These situational variations suggest that both racial and non-racial cues of threat affect shooting decisions. Although the authors did not directly examine how context manipulations signal SES, other research has indicated that SES can be inferred from neighborhood (Sampson & Raudenbush, 2004; Terrill & Reisig, 2003). Thus, Correll and his colleagues (2011) work lays the groundwork for further exploration of the role of SES in shooting decisions.

Similarly, Terrill and Reisig (2003) studied the role of neighborhood on the amount of force used by police officers toward suspects. Various factors including neighborhood as well as officer, victim, and suspect demographics were considered as potential mediators for the amount of force used. Indeed officers used more force toward non-White than White suspects; however, this effect was fully mediated by neighborhood. Officers used the same amount of force toward suspects, regardless of race, in disadvantaged neighborhoods. Only in more affluent neighborhoods did race play an important role in the amount of force used toward the suspect—police officers used more force toward non-White people than White people in affluent neighborhoods (Terrill & Reisig, 2003). Together race and neighborhood prestige proved influential in the police officers' decisions, with neighborhood serving as a potential SES indicator.

Both Correll et al. (2011) and Terrill and Reisig (2003) demonstrated that variations in neighborhoods cause fluctuations in threat-related responses. Given that neighborhood context can be indicative of personal SES, these studies could be indirectly examining the role of SES on decision-making. Other studies that take a similar, indirect approach to examine if perceptions vary toward people with different race and SES backgrounds find that race and SES together influence decisions. Westie (1952) investigated potential fluctuations in desired social distance from Black targets when occupational prestige changed. As Black targets' occupational prestige increased, White respondents experienced decreased prejudiced levels (Westie, 1952), suggesting that occupational prestige, and thus, SES, might negate the effects of racial prejudice. Similarly, Feldman and Hilterman (1974) operationalized target occupation as a symbol of SES to understand racial stereotypes. The authors revealed that both target race and target occupation accounted for a significant amount of variance in racial stereotypes—with higher status individuals experiencing less racial prejudice than lower status others (Feldman & Hilterman, 1974). Additional research suggests that perceived social status influences perceptions toward and evaluations of potential job applicants (Jussim et al., 1987) and neighbors (Kirby, 1999)—with the joint effects of social class and race oftentimes resulting in greater response variations than race alone. Across these studies, together race and SES influence judgments and decision-making.

It is clear from this research that race and SES together affect decision-making. However, many of these studies have taken an indirect approach to manipulating SES (i.e., by altering neighborhood context). It is possible, however, that context-level SES manipulations (SES manipulated through neighborhood) and person-level SES manipulations (SES manipulated on the person) might yield different results. Thus, the present work explored how assessing person-level SES, manipulated through clothing rather than context, in combination with race can influence responding.

By investigating the effects of race and SES on shooting decisions, the focus of the current work is to address an important question and untested assumption in the literature. Rarely do race and SES appear isolated in the real world; therefore, understanding how both features influence decision-making provides additional insight and builds upon

what researchers currently know about shooting decisions. If there is an interaction between suspect race and SES, then understanding the distinction in shooting decisions when faced with four subgroups that vary both in race and SES (Black low-SES, Black high-SES, White low-SES, White high-SES) is of crucial importance. Further, explicating the foundation of the confounding nature of race and SES is of great value scientifically and practically.

2 | STUDY 1 AND STUDY 2 OVERVIEW

Across two studies, we examined the role of race and SES on decisions to shoot by directly manipulating the racial and socioeconomic appearance of a series of criminal suspects. Participants were told to pretend that they were police officers chasing dangerous suspects. Their goal was to decide as quickly as possible whether or not the suspect who appeared on the screen was armed and dangerous or was not. If an armed suspect appeared, their goal was to shoot this suspect. In instances when an unarmed suspect appeared, participants were instructed to respond with a "don't shoot" response to the suspect. Participants were asked to respond as quickly as possible.

We anticipated that both race and SES would influence decisions to shoot. However, we thought several patterns of results could emerge. First, since being Black and being low-SES are both stereotypically associated with danger and threat (Correll et al., 2002; Cozzarelli et al., 2001), people could be biased toward shooting (i.e., shoot armed suspects more quickly and respond "shoot" more often than "don't shoot" even when the suspect is unarmed) when the suspect was either Black or low-SES. If either being Black or low-SES made the suspect dangerous and pushed for a shooting response consistent with Correll et al.'s findings (2011), then we would then expect racial bias toward shooting high-SES Black compared to high-SES White suspects. In contrast, for low-SES suspects, we would expect a general bias toward shooting regardless of race. This hypothesis would theoretically replicate the findings in Correll et al. (2011) and Terrill and Reisig (2003). Alternatively, race might serve as a more salient physical feature than SES and participants could exhibit bias toward shooting Black suspects compared to White suspects regardless of SES. People process race automatically and extremely quickly (e.g., Ito & Urland, 2003); therefore, race could be the more salient indicator of threat. This hypothesis would be consistent with previous shooter bias research that focuses on suspect race only (e.g., Correll et al., 2002), but would only partially replicate shooter bias research that looks at the effect of multiple cues on shooting decisions (e.g., Correll et al., 2011). Finally, because various studies have found that as SES prestige increases, racial biases decrease (e.g., Feldman & Hilterman, 1974; Westie, 1952), it was possible that we might only see biases against low-SES Blacks suspects relative to the other groups. Participants might be more biased toward shooting Black than White suspects, but only in the low-SES condition. However, given the literature on race by SES effects previously mentioned, we were least confident that our results would support this hypothesis. Despite these three contrasting hypotheses, we anticipated that the first hypothesis would be most likely. Both Black and low-SES people, regardless of race, are low in status as compared to White, high-SES people; therefore, suspects who are either Black or low in SES are likely to be perceived as threatening, causing participants to show biased responding toward these groups.

3 | STUDY 1

In Study 1, we examined the role of suspect race and SES on shooting decisions. During the shooter task, some suspects appeared on the screen with a gun, indicating that these individuals were armed and dangerous criminals. Other suspects appeared on the screen with a neutral object (e.g., cellphone, wallet, or camera), suggesting that these individuals were unarmed and safe. Participants were told to determine which suspects were armed and unarmed as quickly as possible.

3.1 | Method

3.1.1 | Participants

One hundred ninety-five non-Black Temple University students (69.2% female; $M_{age} = 20.6$ years; 62% White, 25% Asian, 13% other) participated in this study for partial course credit. Prior to the start of the study, we conducted a power analysis using G*Power statistical software. We determined that 200 participants were needed to detect medium interaction effects ($d = .2$ to $.3$) with 80% confidence; however, we set a target goal of 220 to account for potential missing data.

3.1.2 | Stimuli

Twenty pictures were used as stimuli for the shooting simulation (five for each category: low-SES White, high-SES White, low-SES Black, and high-SES Black suspects; see Appendix for examples). Pictures were selected from the Center for Longevity Face Database (Minear & Park, 2004) and through web-based searches. Stimulus SES was manipulated through clothing (i.e., high-SES suspects were depicted wearing suits, low-SES suspects wore plain t-shirts). We carefully pretested the photos on a sample of 81 participants. This sample was comparable to the participants in the studies. Participants were first asked to rate the perceived SES/social standing of each picture on a 1 (low) to 7 (high) scale. Pictures were selected so that the high-SES images were rated as significantly higher in SES ($M = 5.03$, $SD = .51$) than the low-SES images ($M = 3.28$, $SD = .56$), $F(1, 80) = 577.70$, $p < .001$, $\eta^2_p = .88$. In addition, we only selected images with 100% race consensus.

To ensure that our SES manipulation was successful, we tested the photos on a series of other perceived physical characteristics related to SES including attractiveness, affect, violence, threat, anger, and aggressiveness. Similar to the SES rating, participants were asked to rate the pictures using a 1 (low) to 7 (high) scale. For each of these factors, we found significant differences between the high- and low-SES target pictures with the low-SES targets being rated more violent, threatening, angry, and aggressive than the high-SES targets. However, the effect of target type (high- vs. low-SES) on perceived SES ($\eta^2_p = .88$) was significantly stronger than the effect of target type on the other physical characteristics (e.g., η^2_p's range from .18 to .66). Given that each of the other physical characteristics is associated with

perceived SES, we conducted additional analyses to see if perceived SES mediated the relationship between intended stimulus SES and the physical characteristics of violence, threat, anger, and aggressiveness. Due to the within subjects design of the pilot test, we used the macro MEMORE (Montoya & Hayes, 2017) to conduct the mediation analyses. The meditational analyses revealed that perceived SES completely mediated the relationship between intended SES and the physical characteristics of violence, threat, anger, and aggressiveness, $\beta = .75$, 95% CI (.24, 1.30), $\beta = .74$, 95% CI (.26, 1.25), $\beta = .75$, 95% CI (.29, 1.26), and $\beta = .40$, 95% CI (−.13, .87), respectively. That is, there is no statistically significant difference in the physical characteristic of violence, threat, anger and aggressiveness for the low- and high-SES stimuli after accounting for perceived SES, $t_Y = .31$, $t(78) = 1.18$, $p = .24$, 95% CI (−.22, .85), $t_Y = .26$, $t(78) = 1.18$, $p = .33$, 95% CI (−.27, .80), $t_Y = .25$, $t(78) = 1.00$, $p = .32$, 95% CI (−.25, .75), and $t_Y = .47$, $t(78) = 1.63$, $p = .11$, 95% CI (−.10, 1.03), respectively. These analyses reveal that our intended manipulation of SES was successful, and that perceived SES of the target affected the ratings of the other physical characteristics.

3.1.3 | Shooter task

The shooter bias task had a 2 (suspect race: Black vs. White) × 2 (suspect SES: low vs. high) × 2 (object: gun vs. neutral) within subjects repeated measures design. Participants played the role of police officers chasing dangerous suspects in the field. Images of suspects appeared on the screen with either a gun or neutral object (e.g., cellphone, wallet) superimposed on the picture. All images were uniquely paired with a gun and neutral object such that 40 person and object combination photos were used in this task. Once the image appeared, participants had 730 milliseconds (ms) to make the decision to "shoot" or "don't shoot" depending on whether a gun was present or not. To make the decision participants pressed the corresponding keyboard button. Participants completed 20 practice trials and 240 critical trials (6 blocks with 40 trials in each). Participants received feedback for correct responding, incorrect responding, and for responding too slowly (i.e., > 730 ms).

3.1.4 | Procedure

Once consent was obtained, participants first completed the shooter bias task. Participants then completed other measures beyond the scope of this study that will not be discussed further. The shooter task was programed with E-Prime.

3.2 | Results

3.2.1 | Latency score analyses

We conducted a 2 (suspect race: White or Black) × 2 (suspect SES: high or low) × 2 (object: gun or neutral) ANOVA on the log-transformed latency scores. Five outliers were excluded for having means at least three standard deviations (*SD*) away from the grand mean.

Analyses revealed a significant three-way interaction between suspect race, suspect SES, and object, $F(1, 189) = 24.98$, $p < .001$, $\eta^2_p = .12$ (see Table 1 for untransformed latency data). Simple effects follow-up analyses on high-SES suspects revealed an interaction between race and object, $F(1, 189) = 62.97$, $p < .001$, $\eta^2_p = .25$. Consistent with the first prediction, participants were faster to shoot armed high-SES Black suspects than armed high-SES White suspects, $t(189) = 4.96$, $p < .001$, $|d| = .36$. Additionally, participants were faster to select "don't shoot" for unarmed high-SES White suspects than unarmed high-SES Black suspects, $t(189) = -5.89$, $p < .001$, $|d| = .43$.

For low-SES suspects, we failed to observe an interaction between suspect race and object, $F(1, 189) = 0.09$, $p = .770$, $\eta^2_p < .01$, but observed main effects for suspect race and object, $F(1, 189) = 10.03$, $p = .002$, $\eta^2_p = .05$ and $F(1, 189) = 14.37$, $p < .001$, $\eta^2_p = .07$. When the suspects were low in SES, participants were faster to respond to Black than White suspects (regardless of the object) and faster to respond to armed than unarmed suspects (regardless of race).

Given the pattern of results and the fact that race interacted with object for the high- but not low-SES suspects, we were interested in whether the participants responded differently toward the low-SES White suspects compared to the high-SES White suspects (and in a manner more consistent with the high-SES Black suspects). Participants were faster to shoot armed low- than high-SES White suspects, $t(189) = -2.09$, $p = .038$, $|d| = .15$, but were similarly quick to not shoot the unarmed low- and high-SES White suspects, $t(189) = 1.25$, $p = .213$, $|d| = .09$. Thus, participants were faster to shoot armed suspects when they were low-SES Whites or high-SES Blacks compared to high-SES Whites. These findings indicate that participants perceived both Black and low-SES suspects differently and likely as more threatening than high-SES White suspects and, thus, responded accordingly.

3.2.2 | Signal detection analyses

We analyzed error scores using a signal detection analysis approach (Green & Swets, 1966) and closely followed the guidelines presented in Plant et al. (2005). Seven outliers were excluded from the analyses for having mean values at least three *SD* away from the grand mean.

We analyzed the criterion used to make shooting decisions (c), which assesses the degree to which participants are biased toward not shooting (represented by a positive c score) or toward shooting (represented by a negative c score) the suspects. Analysis of the criterion results revealed a significant race by SES interaction, $F(1, 187) = 10.19$, $p = .002$, $\eta^2_p = .05$. Participants were biased toward shooting high-SES

TABLE 1 Untransformed means (*M*) and standard deviations (*SD*) for latency scores (reaction times in ms) as a function of suspect race, suspect, socioeconomic status (SES), and object type (Study 1)

	Black		White	
	M	*SD*	*M*	*SD*
High-SES				
Armed	494	34	502	35
Unarmed	512	37	502	35
Low-SES				
Armed	495	34	499	35
Unarmed	501	34	504	35

TABLE 2 Means (*M*) and standard deviations (*SD*) for signal detection analyses criterion results (Study 1)

	Black		White	
	M	*SD*	*M*	*SD*
High-SES	−.05	.27	.11	.28
Low-SES	.05	.27	.07	.26

Black compared to high-SES White suspects. However, there was no difference in shooting responses between low-SES Black and White suspects (see Table 2). Thus, the tendency toward shooting the Black compared to White suspects was only present among the high-SES suspects.

3.2.3 | Misses and false alarms

Seven outliers were excluded from the misses (i.e., refraining from shooting an armed suspect) and false alarm (i.e., shooting an unarmed suspect) analyses for having mean values at least three *SD* away from the grand mean. The analysis of the misses revealed a marginally significant interaction between race and SES, $F(1, 187) = 3.60$, $p = .06$, $\eta^2_p = .02$ (see Table 3). Analyses of the misses scores for the low-SES suspects revealed no significant differences in misses between armed low-SES White and armed low-SES Black suspects, $t(187) = 1.33$, $p = .19$, $|d| = .11$. For the high-SES suspects, there was a significant difference in misses between armed high-SES White and armed high-SES Black suspects, $t(187) = 4.26$, $p < .001$, $|d| = .31$. Participants were more likely to mistakenly not shoot the armed high-SES White than the armed high-SES Black suspects.

For the false alarms analyses, there was a significant interaction between race and SES, $F(1, 187) = 10.79$, $p = .001$, $\eta^2_p = .06$ (see Table 4). Analysis of false alarms revealed no differences in participant responding between unarmed low-SES White and unarmed low-SES Black suspects, $t(187) = -0.28$, $p = .78$, $|d| = .01$. However, there was a significant difference in participant responding between unarmed high-SES White and unarmed high-SES Black suspects, $t(187) = -4.78$, $p < .001$, $|d| = .34$. Participants were more likely to mistakenly shoot high-SES Black than high-SES White suspects. The misses and false alarm analyses replicated the latency and signal detection analyses. That is, participants demonstrated biased response times, shooting tendencies, and errors toward suspects who were Black or low-SES and demonstrated the least amount of bias toward high-SES White suspects.

TABLE 3 Means (*M*) and standard deviations (*SD*) for misses results (Study 1)

	Black		White	
	M	*SD*	*M*	*SD*
High-SES	.11	.08	.13	.09
Low-SES	.12	.08	.13	.08

TABLE 4 Means (*M*) and standard deviations (*SD*) for false alarm results (Study 1)

	Black		White	
	M	*SD*	*M*	*SD*
High-SES	.13	.09	.11	.07
Low-SES	.11	.08	.10	.08

3.3 | Discussion

Study 1 demonstrated that shooting responses varied as a function of race in the high-SES condition but not the low-SES condition, such that participants were quicker to shoot armed Black than White high-SES suspects, quicker not to shoot unarmed White than Black high-SES suspects, had a bias toward shooting Black more than White high-SES suspects, made more misses toward armed White than Black high-SES suspects, and made more false alarms toward unarmed Black than White high-SES suspects. Thus, there was evidence of shooting bias when the suspect was Black or low in SES.

4 | STUDY 2

We were curious to see if the effects of Study 1 were replicable to another sample of comparable size. Thus, participants in this study completed a similar shoot/don't shoot simulation as in Study 1.

4.1 | Method

4.1.1 | Participants

One hundred eighty-one non-Black Temple University students (77.3% female; $M_{age} = 19.7$ years; 69% White, 19% Asian, 12% other) participated in this study for partial course credit. Before beginning data collection, we used G*Power statistical software to determine that 200 participants were needed to determine medium interaction effects ($d = .2$ to .3); however, we set a recruitment goal of 220 to account for potential missing data.

4.1.2 | Materials and procedure

The materials and procedure were identical to those of Study 1, with the exception of the following modifications. First, we were concerned that participants were receiving too many practice trials prior to completing the critical trials, possibly making the task slightly less challenging than initially anticipated. Therefore, we changed the amount of practice trials from 20 to 6. Second, we adjusted the shooter bias program's response window from 730 to 630 ms to force participants to make their decisions even faster, with the goal of generating more errors and evidence of automatic responding.

4.2 | Results

4.2.1 | Latency score analyses

We conducted a 2 (suspect race: White or Black) × 2 (suspect SES: high or low) × 2 (object: gun or neutral) repeated measures ANOVA on

TABLE 5 Untransformed means (*M*) and standard deviations (*SD*) for latency scores (reaction times in *ms*) as a function of suspect race, suspect, socioeconomic status (SES), and object type (Study 2)

	Black		White	
	M	*SD*	*M*	*SD*
High-SES				
Armed	481	27	485	28
Unarmed	497	27	491	28
Low-SES				
Armed	475	28	479	29
Unarmed	486	26	489	26

the log-transformed latency scores. Three outliers were excluded for having means at least three *SD* away from the grand mean.

Analyses revealed a significant three-way interaction between suspect race, suspect SES, and object, $F(1, 177) = 14.66$, $p < .001$, $\eta^2_p = .08$ (see Table 5 for untransformed latency data). Consistent with Study 1, follow-up analyses on high-SES suspects revealed a 2-way interaction between race and object, $F(1, 177) = 25.18$, $p < .001$, $\eta^2_p = .13$. Participants were faster to shoot armed high-SES Black suspects than armed high-SES White suspects, $t(177) = 2.73$, $p = .007$, $|d| = .20$. Additionally, participants were faster to select "don't shoot" for unarmed high-SES White suspects than unarmed high-SES Black suspects, $t(177) = -4.88$, $p < .001$, $|d| = .26$.

For low-SES suspects, suspect race and object did not interact, $F(1, 177) = 0.64$, $p = .80$, $\eta^2_p < .001$. However, this analysis revealed main effects for race and for object, $F(1, 177) = 11.95$, $p = .001$, $\eta^2_p = .06$, and $F(1, 177) = 56.10$, $p < .001$, $\eta^2_p = .24$. As in Study 1, participants were faster overall at responding to Black suspects than White suspects and were faster to shoot armed suspects than to not shoot unarmed suspects.

As in Study 1, we also examined the effect of SES for the White suspects and found that participants were faster to shoot armed low-SES than armed high-SES White suspects, $t(177) = -4.88$, $p < .001$, $|d| = .35$, but responded as quickly to not shoot unarmed White suspect when he was low or high-SES, $t(177) = -0.76$, $p = .450$, $|d| = .06$. These findings suggest that the participants were responding with a similar bias toward quicker shooting decisions for both low-SES White and high-SES Black suspects as compared to the high-SES White suspects.

4.2.2 | Signal detection analyses

Eight outliers were excluded from the analyses for having mean values at least three *SD* away from the grand mean. Analysis of the criterion results revealed that there was not a significant race by SES interaction, $F(1, 172) = 0.12$, $p = .727$, $\eta^2_p < .01$ (see Table 6). However, there were significant main effects for race, $F(1, 172) = 16.55$, $p < .001$, $\eta^2_p = .09$, and SES, $F(1, 172) = 7.04$, $p = .009$, $\eta^2_p = .04$. Participants demonstrated a stronger bias toward shooting Black and low-SES suspects compared to White and high-SES suspects, respectively.

TABLE 6 Means (*M*) and standard deviations (*SD*) for signal detection analyses criterion results (Study 2)

	Black		White	
	M	*SD*	*M*	*SD*
High-SES	−.03	.26	.06	.28
Low-SES	−.07	.26	.01	.26

TABLE 7 Means (*M*) and standard deviations (*SD*) for misses results (Study 2)

	Black		White	
	M	*SD*	*M*	*SD*
High-SES	.11	.07	.13	.10
Low-SES	.09	.07	.12	.08

4.2.3 | Misses and false alarms

Eight outliers were excluded from the misses and false alarm analyses for having mean values at least three *SD* away from the grand mean. For the analysis of misses, there was not a significant interaction between race and SES, $F(1, 172) = 0.67$, $p = .673$, $\eta^2_p < .01$ (see Table 7). However, there were significant main effects for race and SES, $F(1, 172) = 26.18$, $p < .001$, $\eta^2_p = .13$ and $F(1, 172) = 11.89$, $p = .001$, $\eta^2_p = .07$, respectively. Analyses of misses collapsed across SES revealed that participants were more likely to mistakenly not shoot armed White than Black suspects, $t(172) = 5.12$, $p < .001$, $|d| = .33$. The main effect of SES revealed that, regardless of suspect race, participants were more likely to mistakenly not shoot high-SES than low-SES suspects, $t(172) = 3.45$, $p = .001$, $|d| = .22$. Thus, participants were more likely to mistakenly not shoot armed White and armed high-SES suspects compared to armed Black and armed low-SES suspects.

For the false alarm analyses, as with the misses, there was not a significant interaction between race and social class, $F(1, 172) = 2.06$, $p = .153$, $\eta^2_p = .01$ (see Table 8). However, there was a significant main effect for race, $F(1, 172) = 6.07$, $p = .015$, $\eta^2_p = .03$, but not suspect SES, $F(1, 172) = .002$, $p = .963$, $\eta^2_p = .001$. Analysis of false alarms collapsed across suspect SES revealed that participants were more likely to mistakenly shoot unarmed Black than White suspects, $t(172) = -2.47$, $p = .015$, $|d| = .17$.

4.3 | Discussion

Just like Study 1, Study 2 reveled that participants shot armed high-SES Black suspects faster than armed high-SES White suspects and were faster not to shoot unarmed high-SES White suspects than unarmed high-SES Black suspects. Participants showed no differences in response times across race for armed and unarmed low-SES

TABLE 8 Means (*M*) and standard deviations (*SD*) for false alarm results (Study 2)

	Black		White	
	M	*SD*	*M*	*SD*
High-SES	.13	.09	.11	.07
Low-SES	.12	.08	.11	.07

suspects. The Signal Detection Analyses partially replicated the effects found in Study 1. Participants showed greater shooting tendency toward Blacks and low-SES suspects. The error score analyses were less consistent. Participants demonstrated greater misses for armed high-SES and White suspects than low-SES and Black suspects, respectively, and had more false alarms for unarmed Black than White suspects, regardless of SES. However, it is clear from these results that participants demonstrated the most amount of bias toward low-SES suspects and Black suspects.

5 | META-ANALYSIS OF STUDY 1 AND STUDY 2

After comparing the results across both studies, consistent findings emerged for the latency analyses and somewhat consistent results appeared for the signal detection and error score analyses. In order to synthesize the results across both studies and determine which effects are reliable, we conducted a meta-analysis for Study 1 and Study 2 results. Following the guidelines presented in Goh, Hall, and Rosenthal (2016), we conducted fixed-effect analyses with mean effect sizes weighted by sample size for each suspect group (armed high-SES White, armed high-SES Black, armed low-SES White, armed low-SES Black, unarmed high-SES White, unarmed high-SES Black, unarmed low-SES White, unarmed low-SES Black). The means and *SD* reported here are the weighted average means across both studies.

5.1 | Latency analyses

Analysis of the latency score effects revealed a significant effect of race for armed and unarmed high-SES suspects, $M_r = .14$, $Z = 2.70$, $p = .007$ and $M_r = .17$, $Z = 3.27$, $p = .001$, respectively. Consistent with Study 1 and 2 findings, participants were faster to shoot armed high-SES Black suspects ($M = 6.18$, $SD = .07$) than armed high-SES White suspects ($M = 6.19$, $SD = .07$) and were faster to select "don't shoot" for unarmed high-SES White suspects ($M = 6.20$, $SD = .07$) than for unarmed high-SES Black suspects ($M = 6.21$, $SD = .07$). There was no significant race effect between armed and unarmed low-SES conditions (armed low-SES White: $M = 6.18$, $SD = .07$; armed low-SES Black: $M = 6.17$, $SD = .07$; unarmed low-SES White: $M = 6.20$, $SD = .06$; unarmed low-SES Black: $M = 6.20$, $SD = .06$), $M_r = .06$, $Z = 1.06$, $p = .29$ and $M_r = .05$, $Z = 0.86$, $p = .39$, respectively.

There was also a significant difference between armed low- and high-SES White suspects. Participants were faster to shoot armed low-SES than armed high-SES White suspects, $M_r = .12$, $Z = 2.29$, $p = .02$. There was not a significant difference between response times toward unarmed low- and high-SES White suspects, $M_r = .04$, $Z = 0.67$, $p = .50$. This further suggests that participants perceive both Blacks and low-SES suspects differently than high-SES White suspects.

5.2 | Signal detection analyses

Meta-analyses of the criterion scores revealed a nonsignificant difference between shooting decisions toward high-SES White ($M = .08$, $SD = .28$) and high-SES Black suspects ($M = .04$, $SD = .27$), $M_r = .08$, $Z = 1.54$, $p = .12$. There was also not a significant difference between shooting decisions toward low-SES White ($M = .04$, $SD = .26$) and low-SES Black suspects ($M = .06$, $SD = .27$), $M_r = .08$, $Z = 1.62$, $p = .11$. These results provide a more consistent picture of the criterion effects found across the studies. Race and SES did not influence the degree to which participants were biased toward shooting or not shooting suspects.

5.3 | Misses and false alarms

Meta-analyses of the misses scores revealed a significant difference between armed high-SES White ($M = .13$, $SD = .10$) and high-SES Black unarmed suspects ($M = .11$, $SD = .08$), $M_r = .15$, $Z = 2.76$, $p = .003$. There was also a significant difference between armed low-SES White ($M = .13$, $SD = .08$) and armed low-SES Black unarmed suspects ($M = .11$, $SD = .08$), $M_r = .09$, $Z = 1.69$, $p = .046$. Participants were more likely to mistakenly not shoot armed low- and high-SES White suspects compared to armed low- and high-SES Black suspects.

For the false alarms, there was a significant difference between high-SES White ($M = .11$, $SD = .07$) and high-SES Black unarmed suspects ($M = .13$, $SD = .09$), $M_r = .14$, $Z = 2.69$, $p = .007$. That is, when the suspect was high in SES, participants were more likely to mistakenly shoot the unarmed Black than White suspect. There was not a significant difference in false alarms between unarmed low-SES White ($M = .12$, $SD = .08$) and unarmed low-SES Black suspects ($M = .11$, $SD = .08$), $M_r = .01$, $Z = 0.28$, $p = .78$. These findings corroborate the latency effects.

6 | GENERAL DISCUSSION

Much of the shooter bias literature has focused on the role of race during shooting decisions—a practical decision given the longstanding history of racial prejudice and discrimination in the United States. In this study, we go beyond current shooter bias literature by examining the influence of suspect race and SES on shooting decisions. Specifically, we focused on whether participants were correctly able to discriminate between armed suspects (the correct response is to shoot suspects paired with a weapon) and unarmed suspects (the correct response is to "don't shoot" suspects paired with a nonthreatening item) when presented with suspects who vary by race and SES.

In the introduction of our article, we outlined three possible ways that race and SES could influence the responses in the simulation. Consistent with the first possibility we outlined, both Studies 1 and 2 revealed that suspect race and SES jointly influenced the speed of shooting decisions. Participants were faster to shoot high-SES Black suspects than high-SES White suspects and to select "don't shoot" for high-SES White suspects than high-SES Black suspects. Responses toward the low-SES targets did not vary as a function of race and were generally similar to the responses toward the high-SES Black suspect. Thus, the presence of one danger cue (the suspect being either Black or low-SES) was enough to bias responses and additional danger cues had little added impact on shooting decisions.

Less consistent findings emerged for the signal detection, misses, and false alarm analyses (a common trend in shooter bias literature; see Mekawi & Bresin, 2015)—most likely due to the different amount of practice trials and different response windows used across both studies. For the signal detection, misses, and false alarm analyses, Study 1 revealed a tendency toward shooting Black suspects only among the high-SES suspects. In Study 2, participants showed greater bias toward shooting low-SES suspects and Black suspects compared to high-SES suspects and White suspects, respectively. Nonetheless, a clear pattern emerged in the meta-analyses such that participants did not show biases toward shooting high-SES White suspects. Specifically, participants more often did not shoot armed White than armed Black suspects. When suspects were high in SES, participants were more likely to shoot unarmed Black than unarmed White suspects. No differences in false alarms appeared for the unarmed low-SES suspects. Thus, the meta-analyses results suggests a general tendency in shooter biases toward Black and low-SES suspects and not toward high-SES White suspects. Latency score analyses similarly demonstrated that participants were consistently slow to shoot (and fast not to shoot) high-SES White suspects—likely due to the fact that neither Whiteness nor high-SES evokes danger cues.

Ample research suggests that danger cues incite threat-related responding (e.g., Correll et al., 2006, 2011; Payne, 2001). Specifically, social cues linked to danger elicit a threat-detection system that infers threat in ambiguous social interactions (Pickett & Gardner, 2005) and triggers specific emotional responses (Gallo & Matthews, 2003). Stereotypes subsequently guide the threat-detection system, leading to hostile reactions toward people from low-status social groups, which tend to be stereotypically linked to threat (e.g., Kraus, Horberg, Goetz, & Keltner, 2011). Since both Black people and low-SES people are stereotypically associated with danger in the United States, the presence of either characteristic could be enough to elicit a threat response. Under this perspective once one initial danger cue elicits a defensive orientation, additional threat cues might have little incremental impact (Correll et al., 2011; Miller, Zielaskowski, & Plant, 2012).

Although our findings are generally consistent with a danger stereotype interpretation, there are other alternative explanations for our findings. For example, ingroup/outgroup identification could serve as another possible explanation for these effects. Social cognition research suggests that perceivers' view and process information about outgroup members differently than ingroup members (Levin, 1996). Specifically, when viewing outgroup members, perceivers tend to think categorically rather than individually about those people and rely on social categories to distinguish outgroup members. Shooter bias research has demonstrated that perceptions of danger could be influenced by outgroup membership such that participants with strong interpersonal threat characteristics are more likely to shoot outgroup than ingroup members (Miller et al., 2012). Participants in our sample most likely identified with the high-SES White suspects as their ingroup members and all other suspect group as outgroup members. It could be that participant ingroup affiliation with high-SES White suspects caused participants to demonstrate the least amount of bias toward this group and the most amount of bias toward the other outgroups (low-SES White, low-SES Black, and high-SES Black suspects).

Researchers, police officers, and community members alike have taken great interest in what social cues shape shooting decisions, especially in relation to race. But threat-detection processes might be more comprehensive than just racial threat perception. As addressed in the introduction, race coupled with other external cues (e.g., gender, environment, etc.) affect shooting decisions differently than just race alone. It is, therefore, reasonable that race coupled with SES provides another layer of complexity to shooting decisions.

One limitation of the current studies is that the samples were limited to college students in an urban setting. Although Philadelphia itself is comprised of a racially and socioeconomically diverse population, the University's surrounding neighborhood is impoverished, majority Black, and has a high crime rate (City-Data, 2015; Temple University, 2016). Thus, our participants might stereotypically associate both Black people and poor people with threat, which in turn could have affected their shooting decisions. However, this is not to say that different racial and socioeconomic exposure would lead to different responding; especially since both poor people and Black people are stereotypically associated with violence and danger. We encourage researchers to continue to compare shooting decisions across a wide array of populations.

Nonetheless, these findings have important practical implications. It is likely that both police officers and laypersons are exposed to similar race and SES stereotypes. That is, cultural stereotypes in the United States associate Black people and poor people with danger and criminality. Research indicates that cultural stereotypes are presumed to influence—although not exclusively—shooting responses (Correll et al., 2006; Correll et al., 2007; Miller et al., 2012). When presented with threatening suspects (i.e., suspects from low status groups), cultural stereotypes about race and SES could guide the threat-detection system in a misguided way and could have life-or-death consequences.

Consistent with this argument, there is evidence to suggest that similar responses would be found in a sample of police officers as were found in this study. Specifically, several studies have examined U.S. police officers' shooting decisions during a race-only first-person shooter bias task and found that police officers' latency responses are similar to both undergraduate and community samples (Correll, Park, Judd, & Wittenbrink, 2007; Plant & Peruche, 2005). It is therefore plausible that when presented with suspects that vary by both race and SES, police officer responses would be similar to responses in the present samples. Should future studies find similar responses among law enforcement officers, educational training programs should be modified to address the influence of multiple cues on shooting decisions. Previous research demonstrates the promising effects of first-person shooter bias training for the reduction of racial bias in police officer responding (see Plant & Peruche, 2005). Heightening police officers' awareness of their personal biases and providing police officers with training on how to overcome these biases (e.g., education about how stereotypes influence decision-making, shooting simulation practice in which suspect race and SES vary) could prevent such biases from affect shooting decisions. Thus, incorporating training on shooting simulations

into training programs may help to reduce bias in decisions regarding use of force.

7 | CONCLUSIONS

Given that both race and SES influenced responses to shoot, the current work adds to the previous literature by examining how both factors jointly influence shooting decisions. Whereas past research has focused on the role of race, the current work emphasizes the need to focus on the role of SES and race simultaneously to understand complex decisions. There is no doubt that racial cues signal threat and foster biased responding. Yet a more comprehensive threat perception framework suggests that a variety of environmental cues could either suppress or encourage threat-related cognitive processes (Öhman, Lundqvist, & Esteves, 2001). We suspect that in multifaceted environments with many cues, race might be the more salient cue in some situations, whereas SES might be deemed more influential in others.

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CONFLICT OF INTEREST

The authors have no financial interests concerning the content of this article.

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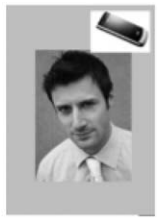
APPENDIX

Examples of Photos Used in Shooter Bias Task

Armed High-SES Black Suspect



Unarmed High-SES White Suspect

Armed Low-SES White Suspect

Unarmed Low-SES Black Suspect