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# The Effects of Implicit Bias in Simulated Police-Public Interactions: An Experimental Study

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**Abstract**
The objective of this manuscript is to explore demographic, legal, and situational considerations on use-of-force decisions. The influence of implicit bias was measured in real time using a police training simulator in an experimental study with university students ($n = 115$). Participants were randomly assigned to one of four scenarios which varied according to the on-screen actor's race (e.g., White/Black) and behavior (i.e., compliance/attack). Bivariate and multivariate regression models were used to estimate the effect of implicit bias on the decision to consider and use simulated lethal force. Actor behavior, independent of actor race, most influenced participant responses. These results suggest that simulated police-public interactions offer significant value in the assessment of implicit bias, particularly in the context of use-of-force decisions. Furthermore, absence of bias is inconsistent with current news and social media narratives about the existence of bias in officer decision-making.

**Keywords** Decision-making · Use-of-force · Random assignment · Simulator · Officer bias

## Introduction

Incidents of police use-of-force[1] have garnered recent media and political attention, often within a framework of racial bias. To that end, research finds that Black males are 2.8 times more likely to be shot by police than White males (Buehler 2017), which is further reinforced by public opinion data of the existence of disparate police treatment of people of color (DeSilver et al. 2020). Together, this is often interpreted as *prima facie* evidence of racial bias by police but fails to take a nuanced look at the immediate situation leading to fatal encounters. Shootings by police officers, nevertheless, negatively impact police-public relations, and communities of color tend to report lower rates of satisfaction and trust in police (Barrick 2014; Brunson and Weitzer 2009; Buckler and Unnever 2008; Peck 2015). Accordingly, the role of officer biases in use-of-force events is a critical area of exploration.

To explore this issue, participants were randomly assigned to engage with scenarios in a police training simulator. Scenarios varied according to the on-screen actor's race and behavior, while being filmed in the same location, and one screen actors used similar dialogue, and mannerisms. Participants were instructed to act as an officer responding to a suspicious person and equipped with a mock handgun. The police training simulator captured if the participant pulled the trigger, while a supervisor observed if the participant picked up the mock handgun. In doing so, this research queries if the race of the on-screen actor and/or behavior impacts participant responses. Prior to getting into the data, the study is contextualized in the extant literature on (1) bias and decision-making, (2) police-public contacts and police use-of-force, and (3) police training.

[1] Use-of-force can be verbal, psychological, and physical coercion used during police officer responsibilities.

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## Bias and Decision-Making

Biased-based decision-making within the context of policing has been distinguished among researchers as explicitly and implicitly motivated.

### Explicit Bias

Expressed primarily in speech and behavior, explicit biases are overtly prejudicial acts that negatively affect social interactions, particularly when directed towards minorities (i.e., race, ethnicity, sex, gender, orientation, religion, and/or creed; Abrams 2010; Shelton et al. 2005). Explicit biases are not developed overnight, nor are they an inherent part of policing; however, research suggests that serving in high-crime communities can perpetuate ideas about who is dangerous and/or criminal (Swencionis and Goff 2017). To that end, the symbolic assailant hypothesis proposes that minority overrepresentation in high-crime areas conveys racialized danger and criminality to police (Skolnick 1966). Waegel (1984), in interviews with police detectives and patrol officers, found support for the symbolic assailant hypothesis. He reported that officers often likened minorities to "animals" in need of control to "keep the peace" (p. 148). This dehumanization of minorities, according to Waegel (1984), "nourishes beliefs about the propriety of harsh or abusive treatment" (p. 148). Similarly, Liu and Flexon (2023) suggest assumptions based on deferential norms can escalate police interactions. Within this context, explicit bias may be used to excuse excessive force against minorities.

### Implicit Bias

Although explicit bias is unlawful, struck from standard operating procedures, and blocked from academy training, implicit bias operates subconsciously and can be just as damaging. Similar to explicit bias, implicit bias is informed by personal characteristic stereotypes and can contribute to prejudice (Spencer et al. 2016). Unfortunately, research finds that implicit racial bias can contribute to different and, at times, lethal consequences. Payne (2001), for example, reported that college students primed with images of Black men were less likely to distinguish hand tools from firearms when compared to those primed with images of White men. This led Payne (2001) to conclude that participants found Black men to be more threatening. Within the context of policing, this can have devastating consequences as dispatcher descriptions can prime officer implicit biases (Spencer et al. 2016; Swencionis and Goff 2017; Taylor 2020).

Where implicit biases are widespread, it has the potential to be normalized within the policing subculture (Swencionis and Goff 2017). The subculture of police is unique, with officers having distinct values, norms, and mores from the public. Moreover, Westley (1970) was the first to characterize the police subculture as embracing secrecy and violence. Later, Herbert (1998) reported that the police subculture has universal, albeit informal, social rules that govern all interactions with the public. Drawing on this, Herbert (1998) reported that police often feel righteous in their maintenance of social order and fight against crime. Over time, officers reinforce their biases among recruits and each other, further entrenching subcultural social rules for encountering minority members of the public (Herbert 1998). Additionally, the professions uncertainty and danger contribute to an "us" versus "them" mentality, which is also often confounded by racial biases (Herbert 1998; Westley 1970).

### Perceptual Shorthand and Biopsychological Impairments

In addition to explicit and implicit biases, decision-making is also informed by the available information and biopsychological impairments. Regarding the former, officers often operate with limited information and draw upon their experiences, training, and perceptions to fill in knowledge gaps. In encounters with the public, for instance, officers do not know the thoughts or intentions of members of the public and, therefore, often rely on their interpretations to protect themselves and the community. This process is known as perceptual shorthand, which is informed by biological, psychological, and environmental factors (Kovera 2019; Pinizzotto et al. 2012; Spencer et al. 2016).

Unfortunately, where racial biases in experiences, perceptions, or training exist, racial disparities can emerge from perceptual shorthand (Kovera 2019; Pinizzotto et al. 2012). To explore this phenomenon, Correll et al. (2002) placed 40 college students in reactionary situations and instructed them to rapidly respond to images of armed and unarmed White and Black males. Respondents selected a "shoot response" for images of Black males faster than for White males. The authors suggested, from these results, that racial biases had affected the participants' responses, namely that their perceptual shorthand identified Black males as more threatening than White males (Correll et al. 2002). Similar perceptual shorthand responses, in policing, can harm minorities, since their overrepresentation in high-crime areas may harden stereotypes of aggression and criminality, and lead to aggressive action (Kovera 2019; Skolnick 1966).

Experience and training, moreover, may promote additional biopsychological impairments that can damage an officers' ability to effectively collect and assess information (Hulse and Memon 2006; Kovera 2019; Phillips et al. 2021; Spencer et al. 2016; Terrill 2009). This is known as perceptual distortion, which can cause individuals to experience dulled hearing, verbal, and memory. Perhaps, the most

commonly known form of perceptual distortion is tunnel vision, whereby officers hyper focus on threats to the exclusion of other potentially relevant sources of information (Hulse and Memon 2006; Phillips et al. 2021; Terrill 2009). Stressful situations tend to exacerbate these effects (Hulse and Memon 2006; Pinizzotto et al. 2012; Phillips et al. 2021; Terrill 2009). Substantively, biopsychological impairments may further limit the information available to officers.

Regardless of its form, bias is a pervasive issue that creates social harms and disparities in police-public contacts (Abrams 2010; Hetey and Eberhardt 2018; Jones-Brown 2007; Mulligan 2021; Peck 2015; Watson and Malcolm 2021; Kovera 2019; Skolnick 1966). Minorities have historically been the targets of bias and have become symbolic assailants in terms of danger and criminality (Hannah-Jones 2021; Jones-Brown 2007; Skolnick 1966). To that end, many interpret the disproportionate use of lethal force by police against racial minorities as evidence of police bias, but decision-making is an imperfect calculus based on incomplete information and hindered by biopsychological impairments. Broader understandings of police-public interactions within this context are needed.

## Police-Public Contacts and Police Use-of-Force

There were an estimated 53.8 million police-public contacts with US residents aged 16 or older (21% of the population) in 2022 (Tapp and Davis 2022), which was down from 24% in 2018 (Harrel and Davis 2020).[2] Most police-public interactions do not involve violence. In fact, less than 2% had force threatened or used against them.[3] Use-of-force events do tend to be on the lower end of the spectrum. Garner et al. (1995), for example, examined 1585 officer surveys from the Phoenix Police Department and found that 62.1% of arrestees did not resist officers while being taken into custody. The most common, albeit infrequent, form of resistance experienced by officers was psychological/verbal (12.4%). Similarly, in sample of 295 officers across the USA, Pinizzotto et al. (2012) found that among 1189 instances where deadly force would have been lawful, officers used lethal force in 7% of the time. They also reported that 70% of officers refrained from using lethal force where it may have been justified. Based on these findings, the authors concluded that officers overwhelmingly demonstrate restraint in their lethal decision-making.

When members of the public did resist, Garner et al. (1995) reported that officers tended to view them as aggressive and used more force to de-escalate the situation and gain compliance (see also Holmes and Smith 2012). Moreover, there are racial variations in the threat and use-of-force. Geller et al. (2021), for example, assessed 9982 use-of-force incidents from 11 police departments and found that minorities were more likely to experience force and severe forms of force than Whites. White proportions fell below 1.0% of their population representation, while Black (4.3%) and Hispanic (2.4%) populations were overrepresented among use-of-force events. To better contextualize racial disparities in police-public encounters, the Washington Post in 2023 began collecting and sharing detailed descriptions (and links to press reports) of police use-of-force events that results in death. While more White members of the public were killed by police in 2021 (i.e., 446 White and 233 Black), Black members of the public were more than twice as likely to be killed by police after controlling for their representation in the population (Washington Post 2023). Raw counts, such as these, are only part of the picture. In 2019, for example, 997 people killed by police, 26 were of unarmed Whites, while 12 were unarmed Blacks. Based on the details of these events, it is difficult to ascribe officer bias to their use of deadly force.[4]

This disproportionality has attracted national attention and prompted calls for greater focus on when officers use-of-force (Walker 2006; White House 2014). Unfortunately, most data sources do not observe situational variables describing the actions of the members of the public involved in the incident. To that end, situational factors can limit officer discretion by law and/or policy and require an officer to respond with necessary force, including lethal force (Worrall et al. 2021). Many departments, for example, require officers to respond with force in situations where a weapon is threatened or used against the officer or member(s) of the public. In a study of 389 Dallas Police officers, for example, Worrall et al. (2021) found no racial differences among individuals who had a service weapon drawn upon them after controlling for situational legal factors. This led Worrall et al. (2021) to conclude that "Black suspects were no more or less likely to have weapons drawn against them than other suspects" (p. 1428). Moreover, situational legal factors, including the immediate situation leading to the encounter and not bias, are consistently found to be the best predictors of officer decision-making in

[2] This may be due, in part, to the lingering effects of the global pandemic and de-policing (Deuchar et al. 2021).

[3] Use-of-force includes threat of force, handcuffing, pushing, grabbing, hitting, kicking, use of chemical or pepper spray, use of an electroshock weapon, pointing or firing a gun, and use of another type of physical force by the police (see Tapp and Davis 2022, Table 3).

[4] Unarmed, however, does not mean that the individual was not dangerous. Among the cases identified as unarmed ($n=38$) included events in which the deceased was driving a vehicle towards police when killed, another was choking an officer after taking and using the officer's Taser against the officer (Washington Post 2023).

empirical research (Fallik 2019; Fallik and Novak 2012; Gottfredson and Gottfredson 1990; Terrill 2005; Terrill and Mastrofski 2002; Worrall et al. 2021).

## Police Training

Concerns around use-of-force encounters have raised questions about police training (Marenin 2004; Phillips 2016; Terrill 2009; Walker 2006). Officers commonly receive training in police academies, which often follow prescriptive and rigid structures (Bayley and Bittner 1984; Garner et al. 1995; Marenin 2004). Additionally, police training has historically been focused on physical techniques and equipment, rather than nuanced responses needed in police-public contacts (Bayley and Bittner 1984; Garner et al. 1995). Marenin (2004), to that end, suggests that militaristic police training does not teach trainees to think independently about force-related procedures. These instructional approaches often neglect the importance of verbal and nonverbal communication to de-escalate continuous environments. As a result, some officers are likely unprepared for the on-the-job realities of police-public contacts, leading them to resort to more aggressive tactics to assert their authority (Marenin 2004). Conversely, contemporary community-oriented police training has been found to foster greater empathy towards victims and improved de-escalation skills (Chappell 2008). Substantively, traditional training methods have been slow to provide necessary instruction on de-escalation, whereas community-oriented approaches offer promise (Bayley and Bittner 1984; Chappell 2008; Garner et al. 1995).

### Officer Anti-bias Training

To prevent bias, police commonly receive (1) stereotype negation, (2) replacement-, and (3) suppression-based trainings. Unfortunately, researchers find these approaches to be accompanied by several unintended consequences (Galinsky and Moskowitz 2000; Paluck and Green 2009; Spencer et al. 2016) and of fairly small effect (Worden et al. 2020). As it relates to stereotype negotiations, for example, trainees are asked to acknowledge stereotypes and urged to remove them from their awareness. While well intended, Galinsky and Moskowitz (2000) found in their experimental design that after receiving training that this caused participants to avoid minorities in social interactions. Additionally, Spencer et al. (2016) found that the increased acknowledgement of stereotypes and attention to race hardened group solidarity and fostered negative views towards racial outsiders. As a result, these methods can inadvertently increase exposure to harmful stereotypes and make them more accessible to officers (Galinsky and Moskowitz 2000). To overcome issues of anti-bias training, perspective-taking training has gained popularity; however, this approach also has issues. Perspective-taking training asks trainees to take on the perspective of a stereotyped individual to foster trainee empathy (Spencer et al. 2016). Trainees, however, have been found to virtue signal their way through training, as opposed to developing sincere empathy (Spencer et al. 2016). Perspective-taking training, therefore, may not be an effective intervention.

In an evaluation of 6321 participants that received anti-bias training, Lai et al. (2016) found that receiving the training reduced participant bias, but the effects were nonexistent a day after the program. The authors suggest that anti-bias training information is poorly retained and/or resilient to real-world environments. Moreover, the impact of anti-bias training is likely to be even more limited because they are often pursued voluntarily by participants with favorable views towards these trainings (Paluck and Green 2009). Critics of anti-bias training also report that most programs are not rigorously reviewed prior to their widespread implementation. In a meta-analysis of 985 program evaluations, for example, Paluck and Green (2009) found that 60% of anti-bias training programs were evaluated without experimental or longitudinal designs. Rather, pre- and post-attitudinal surveys were the most adopted evaluation method observed in this research, which is limited in observing to the effectiveness of short- and long-term training goals (Paluck and Green 2009). Substantively, greater methodological innovation is needed to understand the existence of bias and efficacy of anti-bias trainings.

### The Emergence of Police Training Simulators

Traditional decision-making studies often place respondents in static situations where a “shoot” or “don’t shoot” response is elicited for motionless images; however, these endeavors do not create situational stimuli or immersion (Correll et al. 2002; James et al. 2016). In fact, decision-making is not organic in these conditions because participants are unlikely to experience biopsychological impairments (James et al. 2016). As such, non-simulator-based studies do not create realistic conditions that foster participant engagement or investment (James et al. 2016).

Police training simulators have emerged as a promising method to improve officer decision-making (Bennell and Jones 2005; Eastern Kentucky University 2003; James et al. 2013, 2014, 2016, 2018a, b; Taylor 2020). In police training simulators, verbal, social, and situational awareness skills can be observed and developed, which is critical to countering biases in complex situations (Bayley and Bittner 1984; Garner et al. 1995; Marenin 2004; Pinizzotto et al. 2012; Saus et al. 2006; Terrill 2009).

More specifically, trainees in police training simulators are immersed in environments with responsive on-screen actors that allow trainees to experience the ebbs and flow of varying legal and extra-legal conditions (Bennell and Jones 2005; James et al. 2016). Simulated events are unique because they allow trainees to gain knowledge of the implications of their actions, in real time, but in a safe and controlled environment (Bennell and Jones 2005; James et al. 2016).[5] Officers have historically only gained these kinds of insight into their decision-making through direct contacts with the public, which is inherently risky/harmful (Bennell and Jones 2005). In police training simulators, officer actions can be assessed on lawfulness and consistency against standard operating procedures (James et al. 2016). Within this context, instructors provide feedback to trainees that reinforces positive and proximate outcomes and provides trainees with a roadmap for improvement. In doing so, debriefs have emerged as a significant tool in simulator-based training and require officers to express the legality of their actions (Bennell and Jones 2005).

As police training simulators become a more widespread training tool for law enforcement, it is important that research follows. In an early example where a police training simulator was used in research, James et al. (2013) observed police training simulator engagement with 102 civilian, military, and law enforcement participants. Participants had less lethal reactions towards unarmed Black on-screen actors. More specifically, participants were 6 times less likely to shoot unarmed Black on-screen actors and were 5 times less likely to shoot an armed Black on-screen actor when compared to White on-screen actors. James et al. (2014), using a sample without first responders, also found that the race of the on-screen actor had no effect on participant probability of shooting. This research, however, was based on aggregates across numerous scenarios with participants exposed to different legal and situational environments. In other words, their results may be confounded in an unequal distribution of instances of necessary force.

Findings like these are consistent and challenge the narrative that police (and non-police proxies) use more force towards minorities (Engel et al. 2000; Geller et al. 2021; James et al. 2014, 2013, 2016, 2018a; Klahm and Tillyer 2010; Klinger 1994; Worrall et al. 2021). Furthermore, it is important to evaluate decision-making as a function of police-public relations with thorough experimental methodologies, especially when widespread criticisms of police may be sensationalized in non-systematic news and social media coverage. To that end, police training simulators offer an innovative way of identifying systematic implicit biases and their manifestations in a safe and controlled environment. Using one of the largest samples to date, the current research immerses participants in simulated police-public contacts to detect underlying factors of implicit bias.

[5] In this regard, police training simulators differ from the real world, which has been described as having the omnipresence of danger.

## Methodology

These data were collected using a police training simulator (herein referred to as a Decision-Making Simulator) housed in an academic department of a large university, which is nationally recognized for its diverse student population. The Decision-Making Simulator was used to explore the factors that impact participant behaviors in a simulated environment, including the systematic observation of implicit bias. The study used an experimental design with random assignment among experimental conditions.

### Sample

Criminal justice and criminological researchers often face red tape from government bureaucracies particularly when drawing upon practitioner samples (Eastern Kentucky University 2003, as contrary). To fill this void, studies targeting college students offer a valuable and convenient approach to understanding criminology and criminal justice questions (Wiecko 2010). More specifically, college student populations allow complex social phenomena to be observed within the constraints of bureaucratic realities (Wiecko 2010; Zanes and Matsoukas 1979). College students are also an accessible population for social science research, which can promote greater participation rates. Finally, college students are often at a similar point in their lives and share similar life experiences as cadets, making them a non-representative sample of potential recruits (Wiecko 2010). As such, this study utilized a college student sample to provide a framework for future criminology and criminal justice research on officer decision-making.

#### Participant Recruitment

For inclusion, participants were required to be (1) college students, (2) legal adults, (3) English speaking, and (4) have no self-disclosed cognitive or decisional impairments to ensure they could understand directions, the language spoken in the Decision-Making Simulator scenarios, and grant informed consent. Based on these criteria, participants were solicited by flyers, community boards, targeted emails, and in-class recruitment. Recruitment materials contained links and/or QR codes that allowed participants the ability to digitally sign up for a specific timeslot to reduce participant wait time and enhance participant supervision.

**Fig. 1** Visual similarities and differences in Decision-Making Simulator scenarios

### Procedures and Experimental Conditions

To prevent data contamination, the study was divided into three stages: onboarding, Decision-Making Simulator, and debrief. Throughout each stage, participants had limited contact with one another and were unaware of subsequent stage activities. The initial stage of the study took place in the onboarding room. Upon their arrival, the onboarding supervisor greeted participants and gave a brief overview of the study and Decision-Making Simulator through the informed consent process. Upon agreeing to participate in the study, participants were given an onboarding survey, then waited in the onboarding room to be taken to the Decision-Making Simulator room one at a time.

The Decision-Making Simulator is a two-dimensional projection of movie-like scenarios that have been digitally mapped with infrared (IR) cameras. To enhance its immersion, the Decision-Making Simulator is equipped with surround sound and coded to respond to inputs from various IR light emitting tools, such as mock handguns, mock dart-firing stun guns, and mock pepper spray. In this study, participants were given[6] only a mock handgun that they could, but did not have to, use in the scenario.[7] When the trigger is pulled on the mock handgun, an IR light is emitted and registered by the Decision-Making Simulator.

Participants were randomly assigned to one of four scenarios prior to entering the Decision-Making Simulator room. These scenarios varied based on the on-screen actor's race (e.g., White/Black) and behavior (i.e., compliance/attack). In the scenarios, participants were asked to act as an officer responding to a reported suspicious person in front of homes in a single-family residential neighborhood (see Fig. 1). All of the scenarios were filmed in the same location and actors in the scenario have similar dialogue and mannerisms. Table 1 displays variations in the four scenarios. These similarities offer strong experimental conditions to evaluate the relationship between race and participant responses.

## Measures

The onboarding survey collected demographic and potentially spurious variables to better understand participant characteristics and control for theoretically derived exogenous effects. More specifically and relating to the former, the participants age, gender, race/ethnicity, political leaning, civic engagement, year in school, college major/minor, and GPA were acquired in the onboarding survey. Questions relating to past engagement with Decision-Making Simulators, employment in law enforcement, anticipated work in law enforcement, family in law enforcement, contact with law enforcement, weapon ownership, and prior victimization are also collected to eliminate potential spurious effects with the selected scenario (Celinska 2007; Kleck and Gertz 1995; Kovandzic et al. 1998). Relating to the dependent variables, the Decision-Making Simulator captured if the mock handgun was fired, and the Decision-Making Simulator supervisor noted if a participant touched the mock handgun during the scenario.[8] Regarding the latter, prior research has found that officers are more hesitant to shoot Black suspects but put their hands on weapons quicker, which in and of itself is escalatory (James 2018). For these analyses, our dependent variables observe if the mock handgun was touched (0 = no; 1 = yes) and fired (0 = no; 1 = yes).[9] Finally, all study materials and protocols were approved by the university's Institutional Review Board to assure participant safety.

## Results

To evaluate participant decision-making, the model building process was utilized, and, as such, descriptive statistics, bivariate analyses, data suitability, and regression analyses are presented. The first step in the model building process entails collecting raw counts of the sample's parameters.

[6] The handgun was placed on a stool in front of the participant, since fitted duty belts could not be allocated to match every participant.

[7] Participants received instruction on how to correctly handle, aim, and fire the mock handgun. Instruction was minimal as to not prime participants to resort to use deadly force regardless of randomly assigned scenario.

[8] The supervisor was the same person throughout the study, and they followed a script. They were positioned behind the trainee and did not speak during the scenario.

[9] Shooting accuracy was not measured, since the discharge of a firearm constituted use of deadly force.

**Table 1** Scenario scripts

| | Black male | White male |
|---|---|---|
| *Introduction* | • Actor wearing all black comes into view.<br>• The actor turns around to face you, and he is a Black male.<br>• Male begins to approach you and his hands are empty by his waist.<br>• Male says, "what's up man?"<br>• Male says, "you got a problem?"<br>• Male says, "why are you following me?"<br>• Male says, "I said, 'do we have a problem'?"<br>• Males says, "I'm not doing anything, what's wrong with you?" | • Actor wearing all black comes into view.<br>• The actor turns around to face you and is a White male.<br>• Male begins to approach trainee with his hands in his hoodie pocket.<br>• Male stands in front of the trainee and removes hands from hoodie pockets.<br>• Male says, "what do you want?"<br>• Male says, "excuse me?"<br>• Male says, "who do you think you are?"<br>• Male says, "huh?"<br>• Male says, "Is there a problem here?"<br>• Male says, "what?"<br>• Male says, "you got a problem?" |
| *Attack behavior* | • Male says, "you're going to pull a gun on me?"<br>• Male says, "man, you don't have the guts to shoot me!"<br>• Male begins to advance on the trainee.<br>• Male forms a fist with right hand and continues to advance.<br>• Male steps directly in front of the trainee and attacks. | • Male says, "you're going to pull a gun at me?"<br>• Male says, "you ain't got the guts!"<br>• Male begins to advance on the trainee.<br>• Male forms fist with right hand and continues to advance.<br>• Male swings fist at trainee. |
| *Comply behavior* | • Male says, "okay" and raises hands.<br>• Male says, "alright man" and steps back.<br>• Male lowers left hand.<br>• Male takes another step back.<br>• Male raises both hands again.<br>• Male says, "I don't want no problems man, we're good."<br>• Male begins to retreat down sidewalk away from the trainee.<br>• Male fully turns away from trainee and continues down sidewalk.<br>• Male puts hands down.<br>• Male leaves trainee's view. | • Male begins to raise hands.<br>• Male says, "whoa, whoa, woah!"<br>• Male begins to back up.<br>• Male says, "it's cool man."<br>• Male points further down street away from you and continues to back up.<br>• Male says, "I gotta go."<br>• Male says, "alright" and begins to turn around.<br>• Male continues to retreat down sidewalk away from you."<br>• Male fully turns around and returns hands to hoodie pocket.<br>• Male leaves trainee's view. |

## Descriptive Statistics

Recruitment efforts sought to solicit a broad sample of participants with diverse backgrounds. As shown in Table 2, there were 115 participants who were, on average, 23 years old (not depicted) and primarily female (61.7%). The racial and ethnic makeup of the sample was somewhat equally distributed among White (44.3%) and minority (55.7%) participants. Participants were also found to have diverse political views (Liberal 34.8%, Moderate 14.8%, Conservative 20.9%, and Independent 20%), and nearly two-thirds (61.7%) voted in the prior Presidential election (2020). As it relates to their academic standing, the majority of the sample were undergraduate Juniors or Seniors (63.5%) and students in the College of Social Work and Criminal Justice (41.7%), followed by the College of Science (27.0%) and the College of Arts and Letters (16.5%). The average self-reported GPA among the participants was 3.56, with most participants (80%) indicating a GPA above 3.00 (not depicted).

For many participants, this study was their first time engaging with a Decision-Making Simulator (92.2%), and two participants (1.7%) had experience in law enforcement; though, one-quarter (27.8%) anticipated pursuing a career in law enforcement. Also, 13% had an immediate family member in law enforcement at the time of the study. Most participants (70.0%) reported they had been stopped by police at least one time in their life. One-quarter of the participants (28.7%) reported that they or family member had a negative experience with law enforcement, but most (93.9%) reported they had no arrest history. Nearly one in five participants ($n = 20$, 17.4%) indicated being the victim of a violent crime (e.g., assault, battery, sexual assault). Some participants reported they had taken protective safety measures to avoid victimization: 40.9% reported owning a non-lethal weapon and 16.5% owned a firearm.

Experimental conditions were randomly assigned to the participants, varying the race and behavior of the on-screen actor (see Table 3). More specifically, 13.0% were assigned to a scenario with a Black on-screen actor that attacked participants, 24.3% were assigned to a scenario with a Black on-screen actor that complied with participants, 40.9% were assigned to a scenario with a White on-screen actor that attacked participants, and 21.7% were assigned to a scenario with a White on-screen

**Table 2** Participant demographic and individual descriptive statistics ($n = 115$)

| | *n* | % |
|---|---|---|
| *Age* | | |
| 18–25 | 100 | 87.0 |
| 26–40 | 9 | 7.8 |
| 40+ | 6 | 5.2 |
| *Civic engagement* | | |
| Yes | 71 | 61.7 |
| No | 43 | 37.4 |
| No response | 1 | 0.9 |
| *College major* | | |
| Arts and Letters | 19 | 16.5 |
| Business | 8 | 7.0 |
| Education | 1 | 0.9 |
| Engineering and Computer Science | 8 | 7.0 |
| Medicine | 0 | 0.0 |
| Nursing | 0 | 0.0 |
| Science | 31 | 27.0 |
| Social Work and Criminal Justice | 48 | 41.7 |
| *College minor (any)* | | |
| Yes | 38 | 33.0 |
| No | 77 | 67.0 |
| *Firearm ownership* | | |
| Yes | 19 | 16.5 |
| No | 96 | 83.5 |
| *Gender* | | |
| Female | 71 | 61.7 |
| Male | 44 | 38.3 |
| Non-binary | 0 | 0.0 |
| *GPA* | | |
| 2.50–2.99 | 8 | 7.0 |
| 3.00–3.49 | 30 | 26.1 |
| 3.5–4.00 | 62 | 53.9 |
| No response | 15 | 13.0 |
| LEO anticipated employment | | |
| Yes | 32 | 27.8 |
| No | 82 | 71.3 |
| No answer | 1 | 0.9 |
| *LEO family members* | | |
| Yes | 15 | 13.0 |
| No | 100 | 87.0 |
| *LEO contact* | | |
| 0 times | 38 | 33.0 |
| 1–2 times | 43 | 37.4 |
| 3 or more times | 34 | 29.5 |
| *LEO negative experience* | | |
| Yes | 33 | 28.7 |
| No | 82 | 71.3 |
| *LEO status* | | |
| Yes | 2 | 1.7 |
| No | 113 | 98.3 |
| *Nonlethal weapon ownership* | | |
| Yes | 47 | 40.9 |
| No | 68 | 59.1 |
| *Political views* | | |
| Conservative | 24 | 20.9 |
| Independent | 23 | 20.0 |
| Liberal | 40 | 34.8 |
| Libertarian | 1 | 0.9 |
| Moderate | 17 | 14.8 |
| Multiple answers selected | 2 | 1.7 |
| No answer | 8 | 7.0 |
| *Prior arrests* | | |
| Yes | 7 | 6.1 |
| No | 108 | 93.9 |
| *Race/ethnicity* | | |
| Asian | 2 | 1.7 |
| Black | 20 | 17.4 |
| Hispanic | 19 | 16.5 |
| Multiple selected | 18 | 15.7 |
| Native American | 1 | 0.9 |
| White | 51 | 44.3 |
| Other | 4 | 3.5 |
| *Simulator experience* | | |
| Yes | 9 | 7.8 |
| No | 106 | 92.2 |
| *Victim of a violent crime* | | |
| Yes | 20 | 17.4 |
| No/no answer | 95 | 82.6 |
| *Year in college* | | |
| Undergraduate student 1st–2nd year | 33 | 28.7 |
| Undergraduate student 3rd–4th year | 73 | 63.5 |
| Graduate school | 8 | 7.0 |
| No answer | 1 | 0.9 |

actor that complied with participants.[10] In these scenarios, less than half of the participants (41.7%) touched the mock handgun. Of those that did, 13.0% of the total sample

[10] The distribution of participant characteristics in the random assignment was explored, and few characteristics were found to be concentrated among the experimental conditions (not depicted). Participants, for example, who reported to be members of the College of Arts and Letters ($n = 13$, 27.7%, $\chi^2 = 8.987$) and College of Science ($n = 22$, 82.9%, $\chi^2 = 10.643$) were unevenly distributed among the scenarios with a White on-screen actor, respectfully. Similarly, participants that were firearm owners were particularly concentrated among scenarios with a White on-screen actor that complied ($n = 10$, 40.0%, $\chi^2 = 13.337$). Nevertheless, random assignment into the experimental conditions was largely successful, and these concentrations are not believed to greatly impact the interpretive value of these results.

**Table 3** Distribution of experimental conditions and dependent variables

| | *n* | % |
|---|---|---|
| *Experimental condition* | | |
| Black male, attack | 15 | 13.0 |
| Black male, comply | 28 | 24.3 |
| White male, attack | 47 | 40.9 |
| White male, comply | 25 | 21.7 |
| *Dependent variables* | | |
| Touched weapon | | |
| Yes | 48 | 41.7 |
| No | 67 | 58.3 |
| Fired weapon | | |
| Yes | 15 | 13.0 |
| No | 100 | 87.0 |

and 31.2% of those who touched the mock handgun subsequently fired the mock handgun. The infrequency in which the mock handgun was triggered, coupled with the somewhat limited sample size, prohibited further—more discriminant—statistical procedures of this variable.

## Bivariate Analysis

Significant differences were found among participants that touched ($\chi^2 = 26.483$) and fired ($\chi^2 = 20.105$) the mock handgun across the randomly assigned treatments (see Table 4). More specifically, participants were significantly more likely to touch ($\chi^2 = 7.374$) and fire ($\chi^2 = 6.956$) the mock handgun in scenarios with the White on-screen actor: participants were twice as likely to touch the mock handgun and 8 times more likely to fire the mock handgun when responding to scenarios with a White on-screen actor. Additionally, participants were significantly more likely to touch ($\chi^2 = 24.780$) and fire ($\chi^2 = 14.746$) the mock handgun in scenarios where the on-screen actor attacked. To that end, participants were more than 3 times as likely to touch the mock handgun in scenarios when the actor attacked, and no participant fired the mock handgun in a scenario when the actor complied.

Analysis of whether participants touched and fired the mock handgun by demographic and individual characteristics revealed several significant relationships (not depicted). For instance, approximately two-thirds (68.4%) of participants from the College of Arts and Letters ($\chi^2 = 6.663$) and over half (56.8%) of participants from the College of Social Work and Criminal Justice ($\chi^2 = 7.134$) touched the mock handgun. Participants from the College of Arts and Letters and College of Social Work and Criminal Justice were 2.2 and 1.3 times more likely to touch the mock weapon, respectively. Additionally, most participants with family members in law enforcement ($n = 12$, 80.0%) and almost two-thirds (62.5%, $n = 20$) of participants who anticipated working in law enforcement touched the mock handgun and were four and twice as likely to do so, respectively. Also, participants who reported they had never been stopped by law enforcement were 1.2 times more likely to touch the mock handgun ($\chi^2 = 4.269$). Conversely, participants from the College of Science were 6.8 times less likely to touch the mock handgun ($\chi^2 = 14.512$). As it relates to who fired the mock handgun, women were three times less likely to fire the mock handgun than men ($\chi^2 = 5.892$). Moreover, participants with family in law enforcement were two times less likely to fire the mock handgun ($\chi^2 = 6.261$). Additionally, 29.2% of participants identifying as Conservative ($n = 7$) fire the mock handgun and were found to be 2.4 times less likely

**Table 4** Distribution of dependent variables among the experimental conditions

| | Touched weapon | | | | Fired weapon | | | |
|---|---|---|---|---|---|---|---|---|
| | Yes | | No | | Yes | | No | |
| | *n* | % | *n* | % | *n* | % | *n* | % |
| *Experimental conditions* | | | | | | | | |
| Black attack | 8 | 53.3 | 7 | 46.7 | 1 | 6.7 | 14 | 93.3 |
| Black comply | 3 | 10.7 | 25 | 89.3 | 0 | 0.0 | 28 | 100.0 |
| White attack | 31 | 66.0 | 16 | 34.0 | 14 | 29.8 | 33 | 70.2 |
| White comply | 6 | 24.0 | 19 | 76.0 | 0 | 0.0 | 25 | 100.0 |
| $\chi^2$ | 26.483*** | | | | 20.105*** | | | |
| *Race of on-screen actor* | | | | | | | | |
| Black | 11 | 25.6 | 32 | 74.4 | 1 | 2.3 | 42 | 97.7 |
| White | 37 | 51.4 | 35 | 48.6 | 14 | 19.4 | 58 | 80.6 |
| $\chi^2$ | 7.374** | | | | 6.956** | | | |
| *On-screen actor behavior* | | | | | | | | |
| Attack | 39 | 62.0 | 23 | 37.1 | 15 | 24.2 | 47 | 75.8 |
| Comply | 9 | 17.0 | 44 | 83.0 | 0 | 0.0 | 53 | 100.0 |
| $\chi^2$ | 24.780*** | | | | 14.746*** | | | |

** = $p < 0.01$; *** = $p < 0.001$

than others to fire the mock handgun ($\chi^2 = 6.951$). Lastly, 21.6% of White participants ($n = 11$) fired the mock handgun and were 3.6 times less likely to do so than minority participants ($\chi^2 = 5.872$).

### Data Suitability

Prior to conducting multivariate analyses, a correlation matrix was created to identify variable covariation and potential multicollinearity issues (not depicted). No variables were found to be significant with Pearson's correlation value greater than 0.6, and, therefore, no covariation issues were detected. Additionally, tolerance and variance inflation factor (VIF) estimates were sought to further understand parameter estimates of multivariate modeling among demographic and potentially spurious variables. This process explores multicollinearity issues in more depth. All of the variables observed were above the 0.2 tolerance threshold, and none of the variables had a VIF value greater than 10 (not depicted) (Menard 2010). Each of these variables, with a few exceptions,[11] are suitable to be included in subsequent multivariate models.

### Regression Analyses

To better understand the likelihood of participants touching the mock handgun, Table 5 displays the results from the multivariate binary regression model. The model presented predicts 73.0% of the variance in who touched the mock handgun during the scenarios (Nagelkerke $r^2 = 0.730$). Participants randomly assigned to the scenarios with a Black on-screen actor ($b = -5.167$, $p < 0.01$) and White on-screen actor ($b = -3.474$, $p < 0.05$) that complied were 99.5 and 96.9 times less likely to touch the mock handgun, while controlling for all other exogenous factors, respectively. Additionally, participants from the College of Engineering and Computer Science were 99.5 times less likely to touch the mock handgun, while controlling for all other exogenous factors ($b = -5.385$, $p < 0.05$). No other relationships were observed at the $p < 0.05$ threshold.

## Discussion

Public debate and media attention commonly portray officers as biased against minorities (Hannah-Jones 2021). To this point, minorities commonly perceive their risk for racial profiling and police brutality greater than Whites (Buckler and Unnever 2008), which is supported in the extant literature (Geller et al. 2021; Washington Post 2023). Many officers recognize this environment of public scrutiny and calls for accountability as attacks and have internalize these criticisms (Deuchar et al. 2019, 2021; Nix and Wolfe 2016). Regardless of the reality, this environment has had a lasting impact on law enforcement morale and legitimacy (Barrick 2014; Brunson and Weitzer 2009; Buckler and Unnever 2008; Nix and Wolfe 2016; Peck 2015). Some officers and entire departments, for example, have responded by de-policing and with militarization to protect themselves from the public (Deuchar et al. 2021). Research finds, however, that officer decision-making in public engagements is overwhelmingly informed by legal factors, but this body of research is by-and-large without experimental approaches (Holmes and Smith 2012; Worrall et al. 2021; James et al. 2013, 2016, 2018a). Decision-Making Simulators, however, can fill this knowledge gap and are best used with rigorous methodological designs, including the random assignment found in this study.

To that end, the results indicate that legal factors (i.e., if the participant was attacked) not the on-screen actor's race best informed the decision to use force. More specifically, participants randomly assigned to the scenario with a Black on-screen actor and White on-screen actor that complied were 99.5 and 96.9 times less likely to touch the mock weapon, respectively. This is consistent with similarly methodologically rigorous research (see, e.g., James et al. 2013, 2016) but improves upon prior efforts by amassing one of the largest samples to date and producing a stronger predictive model. Nevertheless, decision-making is complex, as few other predictors explained who touched the mock handgun and there was not enough statistical power to estimate the conditions of who fired the mock handgun.

### Policy Implications

The absence of bias, in this sample, is inconsistent with the current narrative often furthered by news and social media (Buckler and Unnever 2008; Cobbina 2019; Hannah-Jones 2021). More specifically, individual use-of-force incidents are commonly used as evidence of race-based events, without empirical support. While disparities in the justice system are a real issue, the sensationalization of individual events can distract from those discussions (Nix and Wolfe 2016). Real or manufactured, these types of events damage community relations and lower police legitimacy locally, throughout the nation, and worldwide (Barrick 2014; Brunson and Weitzer 2009; Buckler and Unnever 2008; Peck 2015).

Public debate should instead be discussed within an evidence-based approach, which best frames the realities of officer decision-making. In the current experimental study,

[11] Despite suitability for multivariate analysis, participants from the College of Education ($n = 1$), with law enforcement status ($n = 2$), and those who self-identified with political views most consistent with libertarianism ($n = 1$) or non-mutually exclusive political views ($n = 2$), and/or self-identified as Asian ($n = 2$) or Native American ($n = 1$) were omitted from the forthcoming predictive model because their sample sizes lack generalizability.

**Table 5** Multivariate analysis for touch weapon

| | *b* | S.E. | Wald | Exp(B) |
|---|---|---|---|---|
| Age | | | | |
| 18–25 | −4.323 | 2.902 | 2.219 | |
| 26–40 | −1.617 | 2.408 | 0.451 | |
| Civic engagement | 0.468 | 0.939 | 0.248 | |
| College major | | | | |
| College of Business | −2.746 | 1.841 | 2.223 | |
| College of Engineering and Computer Science | −5.385 | 2.194 | 6.023 | 0.005* |
| College of Science | −2.635 | 1.732 | 2.315 | |
| College of Social Work and Criminal Justice | 0.766 | 1.257 | 0.372 | |
| College minor | −1.402 | 1.004 | 1.950 | |
| Firearm ownership | 0.352 | 1.376 | 0.066 | |
| Gender | −2.390 | 1.296 | 3.402 | |
| GPA | | | | |
| 2.50–2.99 | −2.314 | 2.348 | 0.972 | |
| 3.00–3.49 | 1.972 | 1.672 | 1.392 | |
| 3.50–4.00 | 1.311 | 1.655 | 0.628 | |
| LEO anticipation | 1.254 | 1.273 | 0.970 | |
| LEO family | 0.893 | 1.592 | 0.315 | |
| LEO stopped | | | | |
| 1–2 times | −2.641 | 1.535 | 2.962 | |
| 3 or more times | 1.583 | 1.620 | 0.955 | |
| LEO negative experience | 0.326 | 1.276 | 0.065 | |
| Nonlethal weapon ownership | −0.225 | 1.042 | 0.046 | |
| Political views | | | | |
| Conservative | 3.228 | 1.875 | 2.965 | |
| Independent | −1.189 | 1.486 | 0.641 | |
| Liberal | 0.558 | 1.560 | 0.128 | |
| N/A | 1.920 | 2.572 | 0.557 | |
| Prior arrests | −5.743 | 3.243 | 3.137 | |
| Simulator experience | 0.674 | 2.123 | 0.101 | |
| Race/ethnicity | | | | |
| Black | −1.666 | 1.745 | 0.911 | |
| Hispanic | −0.274 | 1.291 | 0.045 | |
| Multiple selected | 1.714 | 1.434 | 1.429 | |
| Other | 3.532 | 2.359 | 2.242 | |
| Victim of a violent crime | −1.309 | 1.636 | 0.641 | |
| Year in college | | | | |
| Juniors and Seniors | 0.712 | 1.201 | 0.351 | |
| Graduate School | −0.052 | 1.934 | 0.001 | |
| Assigned scenario | | | | |
| Black attack | 0.935 | 1.584 | 0.349 | |
| Black comply | −5.167 | 1.611 | 10.289 | 0.006** |
| White comply | −3.474 | 1.500 | 5.365 | 0.031* |
| Constant | 17.243 | 8.401 | 4.212* | 30,809,264.99 |
| Chi-squared | | | 89.942 | |
| Nagelkerke $R^2$ | | | 0.730 | |
| −2 log likelihood | | | 66.328 | |

* = $p < 0.05$; ** = $p < 0.01$

compliance by the on-screen actor was the strongest inoculator against participant touching the mock handgun. Additionally, none of the participants fired the mock handgun in any of the randomly assigned compliance scenarios, which is consistent with prior research (e.g., Engel et al. 2000; James et al. 2014, 2018a; Klahm and Tillyer 2010; Klinger 1994; Novak and Engel 2005; Pickett and Nix 2019; Worden and Shepard 1996). The multivariate model, to this point, found that participants were significantly less likely to touch the mock handgun when the on-screen actor, Black or White, was compliant. This suggests that interactions with members of the public who comply are likely to lead to lower rates of officer use-of-force. Compliance, unfortunately, can be grounded in cultural stereotypes.[12] To bridge cultural gaps between police and public, officer should receive cultural awareness and communication training that deemphasizes stereotype negation, replacement-, and suppression-based approaches, while developing true empathy and understanding of others. While scrutiny largely falls on law enforcement (e.g., Buckler and Unnever 2008; Cobbina 2019; Hannah-Jones 2021), the public also needs guidance on how to interact with law enforcement. This kind of programing should be a facet of community-policing efforts and integrated into school curriculums (e.g., driver education and civics class) to expose youths to the realities of policing, rather than relying on anecdotal and sensationalized stories.

Additionally, disparate police-public outcomes may be attributable to unobserved situational factors. Stressful encounters, for example, can damage people's ability to collect and assess information (Hulse and Memon 2006; Kovera 2019; Phillips et al. 2021; Spencer et al. 2016; Terrill 2009). In a debrief survey of participant Decision-Making Simulator experiences (not depicted), for example, participants overwhelmingly ($n = 95$, 82.6%) reported a strong understanding of Decision-Making Simulator (expectations and directions), but only 15 (24.2%) of the participants that were attacked fired the mock handgun. This disjuncture suggests that stressful stimuli may interfere with cognition and ultimately decision-making. An informal observation in this study was fight, flight, or fright (freeze) reactions, which were overt across each of the randomly assigned scenarios. Reactions to stressful situations, in this manner, are autonomic responses; however, they may be inconsistent with law enforcement standard operating procedures and/or the law. Public scrutiny following the Uvalde shooting, for example, highlights consequences to police legitimacy when officers fail to act (Swaine et al. 2022). Human hardwired autonomic responses are further complicated by biopsychological impairments, and additional research is needed to understand their interconnectivity and impact, especially among law enforcement populations.

Simulator-based research and training offers great promise in exploring these types of empirical questions in a safe and controlled environment. Moreover, law enforcement is receptive to this idea. Research, for example, finds that officers have favorable views towards simulator-based training, primarily due to its high level of interaction and immersion (Bennell and Jones 2005). Training sessions with Decision-Making Simulators also allow participants to develop and refine skills in realistic environments and tend to have higher long-term content retention rates (Bennell and Jones 2005; Hurlock and Montague 1982; Tremblay et al. 2001). Regrettably, there is no data available on how many police agencies use Decision-Making Simulators for training, nor to what degree.

Nevertheless, important work in this area is being pursued through situation awareness training. In this training method, trainees undergo simulated engagements, whereby an instructor breaks down scenarios at critical moments to draw trainees' attention to event details (Saus et al. 2006). As trainees progress, they process event details more efficaciously. Saus et al. (2006), for example, found that officers responding to an active shooter scenario fired more shots and more accurate shots than those who did not receive situational awareness training. Finally, participants receiving situational awareness training tended to have lower heart rates when responding to simulated police-public contacts limiting the impact of biopsychological impairments (Saus et al. 2006). Substantively, situational awareness training teaches officers to be more deliberate and to make information-based decisions in stressful environments.

## Limitations and Areas of Future Research

While this study offers valuable insight to decision-making, future research can improve upon this approach with minor methodological adjustments. For instance, this study measures how implicit bias affects decision-making in police-public contacts; however, the study utilized a student population from a single campus. Substantively, participants from different geographic locations with different experiences were not reached, which presents issues for generalizability. Participants were also solicited through various means of (potentially biased) contact, which may have resulted in over- and underrepresentation of certain populations. This, however, did not appear to cause an issue with the random assignment. Moreover, generalizations for decision-making from this study were limited by the student sample, and further inquiry is needed to generalize results to other populations, including police officers. To that end, the methodology and process outlined herein can be deployed on a law enforcement

[12] Cultural differences should not be interpreted as non-compliance by officers.

population. While gaining access to law enforcement samples can be difficult, due to bureaucratic red tape, this study ensures that future research with law enforcement is of the highest quality.

Additionally, this study would have benefited from enhanced statistical power. Various means were used to reach participants in-person and online but were inhibited, in part, because data collection occurred during a global pandemic. These efforts were further hindered because many students were not on campus, opting for fully online coursework and, as such, few students could be sought through on campus recruitment efforts. While other studies have had more scenarios (see James et al. 2013), one of the largest samples in terms of participants ($n = 115$) was amassed. Unfortunately, multivariate modeling was not possible for one of the dependent variables because activating the mock handgun was a rare event in these scenarios. Subsequently, studies appear to require larger, more robust samples, and participant recruitment should be a continued area of focus of future research.

One way to overcome dispersion issues with smaller samples is to stratify the random assignment into equal groups. Though random assignment is the gold standard in research, ours resulted in unnecessary and unanticipated distribution issues. Though each participant had an equal chance of being assigned to each scenario, equality of chance did not result in equality of outcome. More specifically, participants were randomly assigned to the scenario with a White on-screen actor that attacked 40.9% of the time, while the scenario with a Black on-screen actor that attacked was only assigned 13% of the time (see Table 3). A larger sample could have overcome this statistical power issue, but a stratified random assignment would have also created a more equitable distribution of treatment assignments across the four interventions and strengthened the stability of predictive modeling.

Another data collection approach would have participants interacting with multiple scenarios like in James (2018), whereas participants in this study were observed during a single scenario. Not only would this allow researchers to explore multiple research questions simultaneously, but this approach would also give participants the opportunity to get more comfortable with the equipment and expectations. While exposure may be beneficial in one sense, it could create treatment contamination issues. Researchers adopting this approach should, therefore, randomly order scenarios, and order effects should be controlled when subsequent analyses are conducted.

Finally, future research may also benefit from operationalizing bias by participant lived experiences, like the Implicit Association Test (see James et al. 2016; James 2018). Validated scales, of this kind, could demonstrate the complexities of police-public engagements. To that end, the demeanor and actions of members of the public have continually shown to affect police-public contacts, and, therefore, subsequent simulator-based research should observe these effects (Engel et al. 2000; James et al. 2018a; Klahm and Tillyer 2010; Klinger 1994; Novak and Engel 2005; Pickett and Nix 2019; Worden and Shepard 1996).

## Conclusion

Public sentiment, backed by pervasive disparities in the criminal justice system (see Davis 1971; Demuth and Steffensmeier 2004; Doerner and Demuth 2010; Glaser 2014; Hetey and Eberhardt 2018; Kovera 2019), has impaired law enforcement legitimacy (Brunson and Weitzer 2009; Buckler and Unnever 2008; Cobbina 2019; Hannah-Jones 2021; Peck 2015). To explore the reality of these issues in a safe and controlled environment, this study observed participant decision-making among randomly assigned scenarios in simulated police-public contacts. Supporting previous research, this study found that legal factors, especially on-screen actor compliance, not actor race, best predicted participant decision-making. Though social science researchers have long been criticized for relying on retrospective observational data, Decision-Making Simulators offer researchers the ability to observe social interactions in a safe and controlled environment, while establishing experimental conditions. Efforts should be made to collect national baseline data concerning the number of police agencies that use simulator-based training and to what extent. Decision-Making Simulators offer a vast array of scenarios, exposing participants to different situations, legal factors, extra-legal factors, on-screen actors, and actor verbal and nonverbal cues. Research opportunities with Decision-Making Simulators are, therefore, numerous and untapped.

**Data Availability** Data are available on request from the corresponding author, where appropriate.

## Declarations

**Consent to Participate** Informed consent was obtained from all individual participants included in the study.

**Conflict of Interest** The authors declare no competing interests.

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