EXAMINING IMPLICIT BIAS AND PROCEDURAL JUSTICE: A PILOT INTERVENTION PROGRAM FOR BALANCING THE POLICE-CIVILIAN "ENCOUNTER EQUATION"

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Abstract

This paper investigates the critical issue of implicit bias within law enforcement, discussing its implications on policing practices and community relations. The analysis includes a review of relevant literature, assessment tools, training programs, and policy reforms aimed at mitigating implicit biases. By exploring the impact of implicit biases on decision-making processes in law enforcement, the paper proposes mitigation approaches in a pilot program to drastically reduce or eliminate factors contributing to the "entry" into the criminal justice system via police/civilian interactions, because implicit bias in the US jurisprudence system is even more prevalent, institutionalized, and detrimental (Kang, et al., 2014). This paper hypothesizes five exacerbating factors of the encounter equation: inherent bias, media portrayal, police academy training deficiencies, historical discriminatory practices, and police militarization. The analysis reviews psychological research on inherent bias, documents case studies illustrating its impact on policing, and synthesizes evidence-based strategies for mitigation. Building on this foundation, the article proposes an artificial intelligence (AI)-assisted, andrological-grounded pilot educational plan for police officers and civilians. This plan integrates differentiated instruction and experiential learning designed to foster self-awareness, empathy, and behavior change to reduce implicit bias in actual policing contexts.

Keywords

Implicit Bias, Encounter Equation™, Differentiated Instruction, Constructivist Andragogy

1. Introduction

Social scientists are in relative agreement that, among many factors that precipitate negative "police encounters", implicit bias is a significant trigger. The hypothesis to be studied is the assertion that both sides of the "encounter equation™" have preconceived notions regarding the other's motive. Because one side of the equation carries mandate and authority, this paper focuses on the "decision-making" influences from the police officer's perspective to provide recommendations to address implicit bias.

Policing in the United States is fraught with complexities arising from historical, individual, and institutional dynamics, where inherent bias—both explicit and implicit—plays a pivotal role in shaping police-citizen encounters. This scholarly article critically examines five exacerbating factors of the encounter equation: inherent bias, media portrayal, police academy training deficiencies, historical discriminatory practices, and police militarization.

Implicit bias in law enforcement significantly affects policing outcomes, manifesting in racial profiling, and remains a critical barrier to justice and equality in law enforcement practices. These disparities are particularly manifest in the use of force. These subconscious attitudes and stereotypes operate below the threshold of conscious awareness, influencing decisions in ways that may contradict explicit beliefs about fairness and equality (Staats, et al., 2015). Despite the difficulty in quantifying implicit biases due to their unconscious nature, their effects are visible in various statistical disparities and in the disproportionality of police actions among different racial and ethnic groups (Eberhardt, *et al*., 2004). Addressing these biases is essential for building trust within communities and enhancing the effectiveness of policing. This paper reviews the theoretical background, impact, and focuses on

the "decision-making" influences from the police officer's perspective, to provide and propose an academic mitigation strategy to address and reduce these biases in policing[1].

The highly publicized and deadly encounters between black Americans and the police over the past few years have initiated a flurry of calls for, and the actual manifestation of, police reforms. The *Brennan Center for Justice at NYU* makes the often quoted assertion that "(W)hile comprising only 13 percent of the country, Black people face 21 percent of police contact, make up 33 percent of people behind bars, and are over three times more likely to be killed by the police than their white counterparts." (Subramanian and Arzy, 2021)[2]. Even as there may be some academic disagreement regarding the reliability of the statistical impact[3], the fundamental reality of racial disparity in the American justice system is beyond reproach[4].

The renewed focus on police reform includes advocating for a diversion of public funds from policing to education, housing, healthcare, and economic reforms (Bastian, 2021). The operating assumption is that social policy innovation will decrease crime and thus alleviate the need for police resources. The use of body cameras, de-escalation training, and efforts to address systemic racism were some of the measures implemented to improve police practices (McKenna, 2020)[5].

The broad contours of the justice system in America provide many sources of blame. Conversely, many municipalities struggle to strike a balance between controlling crime and protecting civil rights. Though it is beyond the scope of this inquiry to address the issues contributing to the discriminatory practices, this paper proposes an approach to adopt a pilot program to mitigate factors contributing to the entry through the "gateway" of the criminal justice system: police interactions.

Social scientists are in relative agreement that, among many factors that precipitate "police encounters", implicit bias is a significant trigger. Both sides of the "encounter equation" have preconceived notions regarding the other's motive, but there is absolutely no disagreement that there are significant historical contributions to the consequences of racial discrimination in American jurisprudence.

As there is no serious debate regarding the non-existence of "implicit bias" in policing, the focus of this inquiry employs a qualitative review of existing studies, supplemented by a quantitative analysis of data compiled on police stops, arrests, and use of force. provides an integrated framework for applying implicit association testing, procedural justice education, and community trust-building efforts. The goal is to inform future programming that can enhance equity and legitimacy in police-community interactions.

By integrating these approaches, the paper aims to provide an examination of how implicit biases are detected, measured, and addressed within policing. This inquiry compelled a review of literature that would define "implicit bias" and provide support for the proposed solution: an AI-aided educational pilot program.

This paper explores the development and outcomes of a pilot intervention program designed to address implicit bias in policing through procedural justice training. With increasing public scrutiny of law enforcement practices, especially concerning race and trust, evidence-based behavioral science offers powerful insights into how bias forms and how it can be interrupted.

2. Literature Review

Historical Perspective

The American legal system is fraught with an extensive history of discriminatory practices that adversely impact along racial lines. The roots of U.S. policing are entwined with periods of slavery, segregation, and "war on crime" rhetoric. Policy decisions—such as stop-and-frisk, zero-tolerance policing, or the militarization of police units—have often exacerbated implicit and explicit biases, especially against communities of color (Kahn and Martin, 2020). These forms of discrimination are reinforced by both past precedent and current policies. The ample documented evidence supports the conclusion that people of color in the United States are more likely to be

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[1] The primary author's father and both brothers are former NYPD officers (as are several friends and relatives). This reality obviously "influences" the perspective, but we assert that the perspective is "informed".

[2] The Federal Bureau of Investigation collects and retains the Uniform Crime Report (UCR) data, and the Bureau of Justice Statistics (BJS) collects other criminal justice data; but neither publicly report the factors involved in the Center for Disease Control's (CDC) records for statistics on "deaths by legal intervention".

[3] Scientific inquiry can legitimately hypothesize that the problem is much more pronounced than reported (i.e., Castelvecchi, 2020), while the same data can persuade other academics to conclude that the problem is hyperbolized (i.e., Goldberg, 2023). Interestingly, there is a third perspective that asserts that "exposure to extreme disparities can cause people to become more, not less, supportive of the very policies that create those disparities" (Hetey & Eberhardt, 2018).

[4] A 2020 Pew Research Center found that the significant majority of Americans of all races believe "the U.S. criminal justice system treats black people less fairly," **with white Democrats significantly espousing this view in relation to their white Republican counterparts.**

[5] Internal Police Department efforts to stem the disproportionate impact upon people of color fall into three broad categories: policy reform, enacting of accountability measures, and (the focus of this inquiry) recruitment and training.

arrested (Gase, *et al.*, 2017), convicted (The Sentencing Project, 2018), and more harshly sentenced and imprisoned (Ghandoosh, *et al*., 2023).

Even in the exploration of implicit bias, there is a rational basis for citizens of color, particularly Black Americans, to be wary of the police. Modern law enforcement in the United States can trace its origin to the 1700s, with the practice of deputizing slave patrols to apprehend runaways and prevent revolts (Waxman, 2017; Walsh, 2021). In the 150 years that followed, "policing" was accomplished by volunteer night watches and privately funded patrols by merchants. The transformation from this model to professional police forces corresponded to the transfer of the cost from the business class to citizens writ large.

The first police department in the United States was established in New York City in 1844, and several cities followed suit over the next two decades. Constitutional and ideological perspectives engendered a philosophy of local control over police powers (Dempsey, 1999). Almost exclusively, the province of state and local governments, the authority for policing was further decentralized to the level of political (Larder and Repetto, 2000). This hyper-parochial approach also made policing ripe for political exploitation.

The decentralization of police powers introduced its own series of complications. The rise in multi-jurisdictional crimes encouraged states to enable business corporations the authority to establish private police forces, the most notable being the Pinkerton Agency (Dempsey, 1999). Concurrently, the Federal Government created its own policing agency, the United States Secret Service, to combat counterfeiting in 1865. The FBI (1908) and the investigators from the Department of the Treasury (1920) initiated a trend of executive branch enforcement force creation (Larder and Repetto, 2000).

Massive migration and immigration patterns drastically shaped policing in the US during the late 19th century, particularly in the northeast (Larder and Repetto, 2000). The population dynamics significantly influenced the struggle for political control of the police. Calls for reform eventually led to new managerial strategies and chain of command structures. The desired adoption of a system of independent and professional administration became manifest in a "self-justifying bureaucracy". The introduction and usage of crime statistics were introduced in efforts to professionalize police departments. "For the first time, Americans with European roots were grouped into one broad category, white, and set apart from another category, Black" (Walsh, 2021, quoting Muhammad, K.G., 2019).

This consequential shift in thinking is arguably the single most destructive and racist notion since the practice of slavery. It is from this historical lens that a thoughtful inquiry of redress should begin, as the historic parallels with the current narrative are impossible to ignore.

More recently, the 1980s introduced a "militarized" brand of the police. President Ronald Reagan famously pursued the "war on drugs", leading to a spate of laws and martial policies to address domestic issues. Police officers around the nation began to wear battle-dress uniforms (BDUs), external body armor, and employ tactical weapons. "Shock and awe" tactics once reserved for the battlefield were routinely exercised in urban settings. Consequently, "use of force" became the prerogative of the police.

Until 1985, policies on the use of force varied conspicuously by state. The obvious disparities compelled the Supreme Court to rule in *Tennessee v. Garner,* 471 U.S. 1 (1985)**,** that the police cannot shoot a fleeing suspect unless they have probable cause to believe that "a fleeing suspect posed a significant threat of injury or death to an officer or others". [6] Over the next four years, studies indicated that the number of police killings steadily declined (Kirkpatrick, 2021).

In a 1989 ruling, the Supreme Court in *Graham v. Connor*, 490 U.S. 386 (1989), established the current precedent for "excessive force". The Court held that a claim of excessive force by law enforcement during an interdiction shall be held to the "objective reasonableness standard of the Fourth Amendment", rather than a substantive due process provisions of the Fourteenth Amendment (Kirkpatrick, 2021). Writing for the majority, Chief Justice William H. Rehnquist wrote: "The calculus of reasonableness must embody allowance for the fact that police officers are often forced to make split-second judgments — in circumstances that are tense, uncertain and rapidly evolving — about the amount of force that is necessary in a particular situation."

The Supreme Court's opinion has created massive unintended consequences. Almost every police encounter has the potential to escalate, and depending on circumstances, including implicit bias, the slightest of provocations can evoke over-reactions. By requiring largely sympathetic judges to weigh the "split-second judgment" of a police officer, any claim of impending peril by an officer may justify the use of excessive, even deadly, force.

Mass incarcerations soared over the next 16 years as a result. The punitive result of the "War on Drugs" was reflected in the sentencing laws that required mandatory minimum sentences (Sentencing Project, 2018). Extreme sentences are particularly doled out for violent crimes (including the now ubiquitous "resisting arrest"

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[6] The "probable cause" standard has never traditionally been a substantial threshold, as it significantly relies upon the officer's framing of an incident. In the cases at issue similar to *Garner*, frequently, the suspect was killed, and thus unable to provide contradictory testimony.

addition) and "criminal histories", so the "felonization of drug possession disproportionately impacts Black Americans" (Sentencing Project, 2018).

Despite the arguments (legitimate and otherwise), it may very well be a fact that institutional factors such as historical inequities, a punitive culture, and socio-economic inequities are likely to be more influential than individual-level factors like implicit bias, which manifests in stereotyping or overt prejudice.

To identify and document a social problem, accurate and reliable data is necessary to describe and, ultimately, define the problem[7]. For a variety of reasons, U.S. authorities do not reliably collect useful information regarding domestic use of force by police authorities, and that information that is collected is rarely publicly disclosed. Formal reports that are filed are kept by the specific agency involved in the incident. This has made it very difficult to identify systematic patterns or inequalities that impact police officers' decisions to use force. Quantifying the magnitude of the impact of racial disparity in the US Justice system requires extrapolation from sometimes incomplete and inconsistent data sets. Researchers are frequently reliant upon the scant information gleaned from the FBI and the BJS, as extrapolated from the CDC and the National Vital Statistics System, in "reporting" statistics.

The extent to which the phenomenon is "measured" is primarily discernible indirectly. Implicit biases in policing manifest through various operational outcomes, such as the disproportionate targeting of minority communities for stops and searches (Gelman, Fagan, & Kiss, 2007). The literature provides numerous case studies and statistical analyses that demonstrate how these biases contribute to significant disparities in law enforcement practices.

Definition and Theoretical Background

Social psychologists suggest that bias occurs in the "three psychological components: affects (i.e., prejudice), cognition (i.e., stereotypes), and behavior (i.e., discrimination)" (Hagiwara, *et al*, 2020)[8]. Implicit bias refers to the attitudes or stereotypes (re: a social group or its members) that affect our understanding, actions, and decisions unconsciously (Greenwald & Krieger, 2006). The term was introduced in 1995 by social psychologists Banaji and Greenwald (Greenwald & Banaji,1995). These biases are pervasive and known to infiltrate various societal roles, including law enforcement, where they can lead to prejudicial treatment based on race or ethnicity.

The first Implicit Association Test (IAT) was published in 1998 (Greenwald, McGhee, & Schwartz,1998). The IAT is "a psychological test that aims to reveal unconscious attitudes, preferences, and biases by measuring the time that it takes an individual to classify concepts into two categories" (Ocejo and Lopez, 2024). The test[9] assumes that concepts that are strongly associated in memory will be easier to pair.

IAT experiments are typically conducted to determine whether there is a correlation between a hidden bias and discriminatory behavior. These correlations could be expressed as stereotypes or prejudice. While these tools offer valuable insights, their applicability and effectiveness in policing contexts remain subjects of ongoing research and debate (Jolls & Sunstein, 2006).

Numerous studies have, however, confirmed the link between hidden biases and actual behavior (Greenwald & Krieger, 2006; Correl, *et al*., 2014; Staas, *et al*., 2015; Hagiwara, *et al*., 2020; Cherry, 2024; Ocejo & Lopez, 2024). In 2016, the *Joint Commission on Healthcare* studied the problem of implicit bas and healthcare outcomes. The Commission concluded that "Scientific research has demonstrated that biases thought to be absent or extinguished remain as 'mental residue' in most of us".

Implicit bias is significantly expressed in two general ways: perception errors and frequency illusions. Perception errors manifest in two versions: the "halo effect" and the reverse halo ("horn") effect. The "halo effect" refers to the cognitive bias where positive attributes or qualities are ascribed to a person without evidence supporting the attributions (Thorndike, 1920; Perera, 2023). Mental associations of "attractiveness" with "competence" or "height" with "athleticism" are some examples. The "reverse halo effect" is the phenomenon whereby a person's positive trait elicits a negative connotation, such as associating "attractiveness" with "snobbery" or "weight" with "intelligence".

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[7] Contributing author, Dr. Suzanne Lea, comments that "While no national-level data has been collected to document patterns among such incidents on a macro-level, one can find a remarkable amount of information regarding police officers killed in the line of duty. Compiled by the Federal Bureau of Investigation (FBI) as part of the UCR data, this data, which is referred to as Law Enforcement Officers Killed and Assaulted (LEOKA) it dates back to 1996, includes forty-five tables and five figures (http://www.fbi.gov/ucr/ucr.htm#leoka). Details include the height and weight of the offender, the time of day of the incident, and scores of other data points that painstakingly detail these incidents."

[8] The authors assert that "implicit bias includes both affective and cognitive components", academics and professionals "often use the term broadly and do not differentiate prejudice and stereotyping".

[9] The Southern Poverty Law Center provides an online version of the IAT:
https://www.learningforjustice.org/professional-development/test-yourself-for-hidden-bias

Frequency illusions result from unsystematic errors in understanding skewed distributions, resulting in the mistaken belief that certain events or phenomena happen more often than they actually occur. Because of an implicit bias in the processing of information, frequency bias is usually accompanied with *confirmation bias* (the tendency to seek evidence confirming a belief, while ignoring evidence to the contrary), *recency illusion* (attaching primacy to events occurring closer in time to the present) or the *split-category effect* (concluding a higher frequency of circumstances through the mental aggregation of smaller subcategories) (Stevens & Bavelier, 2021).

The study of implicit bias can be directly traced to social cognitive theory (SCT). SCT asserts that human behavior is the "sum of the interactions" between the personal, environmental, and observable learning patterns (Bandura, 1977). Several studies over the past forty years have demonstrated a link between hidden biases and a subject's inability to control personal impulses due to fatigue, competition, decreased attention, distraction, or time pressure (Bodenhausen, 1990; Kruglanski & Freund,1983; Jamieson & Zanna, 1989; Pratto & Bargh, 1999; Stevens & Bavelier, 2021). These environmental influences resulted in increased implicit effects of cues peripheral to the subject's task (Cherry, 2023).

Bias in Policing

Within the domain of "implicit bias in policing", extensive research illuminates three raging debates: (1) arguments regarding the magnitude of the problem; (2) the extent to which implicit bias can affect police officer decision-making processes and subsequent behavior; and (3) concerns regarding the efficacy of proffered solutions. To the extent there is disagreement, there is no legitimate dispute regarding the existence of the issue. Academic and scientific research have consistently documented the impact of implicit bias in the American justice system.

But beyond the direct and deleterious effects of implicit bias on the victims, the consequences also continue to indirectly and adversely impact how the public engages with police forces. Regardless of the particular debate engagement, discussions on both "magnitude of the issue" and "efficacy of solutions" appear to yield an interesting conundrum: the analysis itself may be indicative of "anti-police" bias. The relationship between implicit bias and behavior can be bidirectional, influencing experiences that also affect implicit biases (Spencer, Charbonneau & Glaser, 2016). Attempts to address the issues regarding implicit bias are plagued by the very phenomenon they seek to explore.

Public perception of the police substantially influences the debate[10]. As a very tangible representation of government, the police inherently demonstrate the values of a democratic society. Police performance "serves as a barometer for a community's sense of peace and well-being" (Malman, 2012). The data from a 2023 Gallup Poll[11] reveals that Americans' personal experiences with police encounters also shape their perceptions of policing.

Three Pew Research Center from the period 2016-2019 were summarized in the Pew Research Report entitled "10 things we know about race and policing in the U.S." (DeSilver, *et al*., 2020)[12]. The reports substantiated generally asserted positions: 65% of Black respondents indicated they've been perceived as suspicious because of their race or ethnicity and five times more likely than whites to say they've been unfairly stopped by police.

Public perception has consequences for the police. Despite several studies reporting the converse, a police advocacy group, the National Fraternal Order of Police, asserts that, in 2022 there was a 19% increase in officers being shot while in the line of duty. The report counted 35 ambush-style attacks on law enforcement officers, which resulted in 57 officers shot, 12 of whom were killed (Dilanian & Li, 2022).

Within this lens of inquiry, it is also important to note that legitimate academic inquiry of implicit bias in policing often deteriorates into "quantification exercises" that debate "magnitude." For example, while government statistics estimate the number of fatal officer-involved shootings at approximately five hundred per year in the United States, an inventory of news reports compiled by *The Washington Post* asserts that the actual number is more than double (https://www.washingtonpost.com/graphics/investigations/police-shootings-database/).

Because the phenomenon of implicit bias in policing is primarily discernible indirectly, Mathematicians and statisticians have been integral to the debate. Their contributions have simultaneously illuminated the frequency fallacy of the general US public regarding "police encounters", while casting aspersions of governmental data reports[13]. Despite media reports to the contrary, there has been a steady decline in arrest rates across the US in the past 25 years. From 1997 to 2021, there is a general consensus that arrest rates have dropped by more than 70%[14]

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[10] Since 2016, the share of Americans who say that police use the right amount of force, treat racial and ethnic groups equally and hold officers accountable for misconduct has declined substantially, according to the Pew Research Center.

[11] Gallup Center on Black Voices: https://news.gallup.com/315575/measuring-black-voices.aspx

[12] See Footnote 4.

[13] There is a small movement among academics to boycott police work in the wake of deaths resulting from "racially motivated" police actions (Castelvecchi, 2020).

[14] Compare data excerpts, for example, from Statista, https://www.statista.com/statistics/191267/arrest-rate-for-all-offenses-in-the-us-since-1990/#:~:text=In%202022%2C%20the%20arrest%20rate%20in%20the%20United,was%202%2C110.3%20arrests%20per%20100%2C000%20of%20the%20population; Vera, https://www.vera.org/publications/arrest-trends-every-three-

To measure the degree and impact of implicit bias in policing, academics have relied upon extrapolation. Mathematical modeling by Jack Glaser, a Professor at the Goldman School of Public Policy at the University of California, Berkeley, illustrated how Police Departments were misusing data to justify the focus of resources in minority neighborhoods, leading to disparities in criminal justice outcomes (Glaser, 2006). Glaser subsequently participated in another study that determined that the percentage of people shot by police who were unarmed was more than twice as high for Black people than for White people (Charbonneau, Spencer & Glaser, 2017).[15] This same group of researchers, in 2010, anecdotally concluded that "among off-duty police officers who were fatally shot by on-duty officers over a period studied, eight of ten were Black, a disproportion that we estimated had a less than one-in-a-million probability of occurring by chance".

In a 2024 *Daedalus* report (Glaser, 2024), Glaser reasserted the finding in the 2010 and 2017 studies, supporting these findings with studies estimating that the lifetime risk of being killed by police is about one in one thousand for Black men; twice the likelihood of American men overall.[16] Glaser also reported that "multiple research groups using heterogeneous methods have consistently found Black Americans to be disproportionately subject to all nonfatal levels of use of force by police".

While the math is helpful to ascertain impact, it is insufficient in presenting an understanding of the extent to which implicit bias can affect police officer decision-making processes and subsequent behavior. Too often, police encounters with people of color that devolve into a "use of force" scenario are misattributed to racist behavior.

The nature of policing and police training profoundly contributes to the implicit biases in personnel. Institutional dynamics, including historical inequities, the punitive nature of the culture, and political and media forces, are likely more influential than implicit stereotyping (Devine, 1989). Police resourcing has been traditionally "overallocated" to address issues in "higher crime" areas. From a sheer numbers' perspective, the likelihood of officer interactions will skew to "poor" and minorities.

In the course of their employment, police officers likely encounter more criminals than the average professional. Associations between negative concepts like crime, with criminals committing crimes, would be reinforced by encounters (Charbonneau, Spencer, & Glaser, 2017). Confirmation bias would likely inform this association to be more pronounced in police officers who lack the ethnic, cultural, or customs identity of the individuals with whom they interact.

There have been numerous studies examining the political influences on allocations of policing resources in differing communities. The debate largely bifurcates into positions of "rational choice theory" vs. "conflict theory". Rational choice theory (Coleman, 1990) argues that police resources are distributed in accordance with the need for crime control, whereas conflict theory (Turner, 2003) asserts that they are allocated with the aim of controlling the poor and racial and ethnic minorities. The conflict argument is more consistently supported by research, but policing models in the bi-level optimization framework suggest otherwise[17].

Police training is predictably focused on addressing threats to the public and to the police officer. Police instruction prepares police officers for a role envisioned, but drastically different from the role they actually perform. The culture of training is distinctively militaristic, with a focus on the deployment of force and weapons. The violent encounters police are trained for are mismatched with the reality of the job requirements, which sometimes results in fatal consequences. (Karma, 2020).

Like all humans, police personnel are prone to stereotype-biased judgments. On an individual basis, it is fairly well-established that implicit biases will most influence judgment and behavior when a situation is ambiguous (Bodenhausen, 1990; Kruglanski & Freund,1983; Jamieson & Zanna, 1989; Pratto & Bargh, 1999; Charbonneau, Spencer, & Glaser, 2017). People tend to rely on pre-conceived notions (including prejudice and stereotypes) when attempting to navigate uncertain circumstances. This reliance is even more pronounced when cognitive resources are taxed (Bodenhausen, 1990). The combination of the police training "focus", with a fundamental lack of cultural, racial or ethnic understanding, predictably results in "use of force" police encounters, which do occur with much greater frequency within certain segments of the population.

A University of Colorado Boulder (Correll, *et al.*, 2014) performed a study of police officers using a "shooter video game".[18] The initial findings demonstrated that police officers performed generally well in avoiding

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seconds-landing/arrest-trends-every-three-seconds/findings; and, the US Department of Justice, https://bjs.ojp.gov/sites/g/files/xyckuh236/files/media/document/fjs21.pdf.

[15] The report acknowledged that the racial disparity declined in 2016, attributing this factor to the lower percentage of fatal officer-involved shootings involving unarmed victims.

[16] For example, Roland G. Fryer Jr., "An Empirical Analysis of Racial Differences in Police Use of Force," *Journal of Political Economy* 127 (3) (2019): 1210–1261; Amanda Geller, Phillip Atiba Goff, Tracey Lloyd, et al., "Measuring Racial Disparities in Police Use of Force: Methods Matter," *Journal of Quantitative Criminology* 37 (2021): 1083–1113.

[17] Computer simulations of decision theoretic approaches (e.g. spatio-temporal continuous-time models of crime) would not significantly alter police allocations, just the deployment scenarios.

[18] https://www.csun.edu/~dma/FPST/consent.html

shooting unarmed targets of all races, but when a shooting was warranted, officers reacted more quickly against black suspects, suggesting some degree of racial bias (Lopez, 2016).

But the UC Boulder study implied that implicit biases may be reduced over time through practice and experience. Training sessions helped officers learn to focus more on other cues instead of race (Lopez, 2016). The research concluded that "police are affected by target race in some respects, they generally do *not* show a biased pattern of shooting. We suggest that police performance depends on the exercise of cognitive control, which allows officers to overcome the influence of stereotypes, and we conclude with potential implications of this research for law enforcement" (Correll, *et al*., 2014).

The efficacy of proffered solutions has been met with stark skepticism among some academics. "Goals and motives, like beliefs and attitudes, can operate outside of conscious awareness or control" [Glaser, 2024, citing Chartrand, T. & Bargh, J., "Automatic Activation of Impression Formation and Memorization Goals: Nonconscious Goal Priming Reproduces Effects of Explicit Task Instructions," *Journal of Personality and Social Psychology* 71 (3)(1996): 464; and Shah, J. & Kruglanski, A., "When Opportunity Knocks: Bottom-Up Priming of Goals by Means and Its Effects on Self-Regulation," *Journal of Personality and Social Psychology* 84 (6)(2003): 1109].

Some researchers maintain that implicit biases are highly resistant to change, as they are <u>ingrained over time and reinforced by societal biases</u> and environmental and contextual factors. A *Council on Criminal Justice* study on implicit bias training (2021) questioned the degree to which implicit bias training can influence officers. It concluded that "it would be more impactful to reduce the volume of high-discretion police stops" as a method[19] to reduce implicit bias in policing (Council on Criminal Justice, 2021). Similarly, a New York City study found no correlation between NYPD officers receiving implicit bias training and changes in racial disparities in police interactions, or citizen complaints (Worden, *et al*. 2020).

Philosophy

Educational strategies, including discussion groups, case-based learning, and simulation, have been found to be effective for healthcare professionals (Kruse, Collins, & Vugrin, 2022). Successful techniques often involve thorough program planning, careful selection of content-expert program facilitators, participant support, and system-level commitment, as found in healthcare settings, and are worth investigating in other professional arenas (Kruse, Collins, & Vugrin, 2022). While literature on mitigating implicit biases in the healthcare field is prevalent, eliminating implicit biases in other industries is limited.

The artificial intelligence (AI)-assisted, andragogically grounded pilot educational plan for police officers and civilians should be predicated on a constructivist andragogy that encourages students to develop their own frameworks of conceptual understanding. The constructivist andragogy is an approach to education espousing the principle that the most effective outcome involves students engaged in active inquiry (Atwell & Jang, 2013). The course content encourages pragmatic and personal applications of theory to simulated scenarios, fostering a constructivist problem-based approach to learning.

Instrumental to gaining perspective, this proposed course should include practical applications of fundamental IAT evaluations and scenario planning. Modules will include opportunities to meet and interact with citizens in non-police engagements. Strategies for curriculum enhancement include experiential learning activities that enable students' access to subject matter experts. The use of multimedia approaches to instruction, including virtual reality (VR) technologies, will afford students opportunities to navigate "high impact" events with low risk.

The proposed pilot education program would ideally create an interdisciplinary experience through differentiated instruction tailored to the specific lens through which a student may approach the subject matter. Differentiated Instruction refers to the andragogical approach to address differences in student interests by offering unique learning experiences within a single course (Tomlinson, 1999). Differentiated instruction differs from individualized instruction in that the learning experience may vary, but the course content, focus, activities, or outcomes are related to the course objective (Boerlens, et al., 2018).

Among the methodologies employed to integrate a differentiated instruction paradigm is the implementation of active learning and experiential learning strategies. Active learning is defined as "educational methods in which students are involved in higher-order thinking exercises like analysis, synthesis, or evaluation (Neil, 2010). The objective of this approach is to improve the learning experience of students by "deconstructing" discipline elements relative to student characteristics. Concept mapping, problem solving, and role-playing are all examples of active learning (Felder and Brent, 2016).

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[19] Glaser (2024) came to the same conclusions: "In the absence of reliable methods for eliminating implicit (or, for that matter, explicit) biases, and with research indicating that trainings promoting cultural awareness, diversity, and fairness do not reliably reduce disparities in the real world, minimizing the vulnerability factors for discrimination is the best option. Reducing discretion and, ideally, replacing it with prescriptive guidance and systematic information (that is, valid criteria) has been shown to be effective with respect to stop-and-search decisions in policing."

Communication Analysis

A central component of any proposed educational program is engaging AI strategies to model and research human communication. Speech, language, and cognition provide the foundation for communication. Speech refers to articulation, which is the production of sounds and the combination of sounds to make words, voice, which is how we use our voice to make sounds, and fluency, which is the rhythm and flow of speech (American Speech Language and Hearing Association, n.d.). Language is the organization of words to communicate meaning, and cognition refers to mental processes of thinking that include attention, orientation, problem solving, memory, judgment, and executive functioning (American Speech Language and Hearing Association, n.d.).

Disorders of speech and language are prevalent, with 5% to 10% of Americans living with a communication disorder (Mayo Clinic Health System, 2022). Having these deficits makes speaking, reading, writing, and understanding difficult, leading to a breakdown of communication. Individuals who have trouble communicating face harmful false prejudices and severe social stigma, leaving those impacted vulnerable to implicit bias (Taylor, 2021).

Awareness campaigns, community education initiatives, and training programs to provide knowledge and understanding of communication disorders will help mitigate biases against those who have atypical communication abilities (Janiel, 2023). Additionally, education and training can foster critical thinking skills, encourage empathy and understanding, help people identify and confront their biases, and create inclusive environments. Training in how to communicate with individuals in high-pressure situations, empathy, understanding, and identification of individuals who are having difficulty understanding at the moment may prove beneficial as well.

AI Usage in Police Instruction

AI technologies[20] offer adaptive learning platforms capable of personalizing instruction based on individual learners' needs, which aligns with the principles of *differentiated instruction*. Such platforms can assess baseline attitudes through surveys and behavioral simulations, using natural language processing and machine learning to adjust the learning path for each officer. By way of example, an officer showing high levels of bias in simulated interactions may receive more intensive, reflective modules that focus on empathy, community history, and de-escalation strategies (Zhou et al., 2021).

These AI-driven tools can also incorporate *constructivist andragogy*, which emphasizes the active role of adult learners in constructing knowledge through personal experience and reflection (Merriam & Bierema, 2014). Through realistic, AI-generated scenarios that replicate complex, emotionally charged situations, officers can confront their own assumptions and develop a deeper understanding of the community contexts in which they operate. biometric signals to track emotional states in real time. Complementing the VR/AI scenario-based training modules, emotional data output provides a quantifiable layer of how police respond under stress, time pressure, or perceived threat. The emotional data can be anonymized and aggregated to evaluate trends across the cohort, adding rigor to outcome measurement.

These AI scenarios will develop to form the workbook of the training program. AI-generated scripted audio scenarios will be the first step to the fully developed program of AI VR sandboxes driven from those scripts. Using immersive technologies such as virtual reality (VR) and augmented reality (AR), AI systems can simulate community-policing scenarios that allow officers to engage in perspective-taking and role-reversal exercises (Dieker et al., 2019).

3. Discussion

The proposed pilot program will successfully illustrate a differentiated instruction design that will effectively integrate training strategies to mitigate and reduce the impact of implicit bias in police officers. It is expected that the success of this pilot program will encourage the police departments across the nation to incorporate these proposed learning modules within their core Academy Training for new officers.

Using a specially designed and integrated *Biometric Emotional Data* framework for applying implicit association testing, effective procedural justice education, and community trust-building efforts can be realized. The goal is to inform future programming through *enhanced measurement of implicit bias triggers* that can promote equity and legitimacy in police-community interactions.

In addition to IATs and self-report tools, the biometric emotional data can provide an additional lens into unconscious bias by identifying physiological emotional signatures that arise in response to particular stimuli (e.g., voice tone, body language, or cultural cues). This data could help isolate when bias-related triggers occur in a policing scenario and track whether training interventions reduce the physiological stress response over time. Police Officers could review their own emotional data following a simulated or real encounter, reflecting on how

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[20] Nicole Gibson, founder of inTruth Technologies, is a pioneer in the utilization of AI in cognitive perception, and provided a general approach for this article.

emotional regulation (or dysregulation) impacted their decision-making. This creates a feedback loop that supports self-awareness and behavior change.

By extending the data collection to both police personnel and community participants, the educational pilot could measure shared emotional states during joint workshops or dialogue circles. This would offer an innovative, evidence-based way to evaluate trust-building efforts beyond qualitative surveys.

The Role of Speech and Language in Human Interaction

Human language is the avenue of communication and thought (Leiberman & McCarthy, 2015). Communication is the active method of exchanging ideas, information, wants, needs, feelings, and preferences (American Speech-Language and Hearing Association, 2025). Communication is inclusive of expression and understanding, and methods of expression include vocalization, verbalizations, signs, gestures, pictures, symbols, printed words, objects, and support output from augmentative and alternative devices (Beukelman & Mirenda, 2013). Effective communication transcends exchanging information as it refers to understanding the intentions and emotions conveyed by the information (Marbun, Antarani, & Amalia Putri, 2023). Furthermore, clearly conveying a message involves listening to understand the meaning and intent of the message that is received with purpose and clarity (Marbun, Antarani, & Amalia Putri, 2023).

While individuals are complicit in their awareness of their prejudices or negative attitudes towards groups of people and may allow those attitudes to influence their behavior, those with implicit bias are unaware of their subconscious perceptions that impact their decisions and responses. Both implicit and explicit bias are problematic as they lead to discriminatory behavior (Shah & Bohlen, 2023). When communicating, verbal and non-verbal information is shared. Non-verbal reactions within the communicative exchange are conveyed through facial expressions, body language, tone, and posture (Walker, 2016). Nonverbal communication can be interpreted negatively with assumptions about the attitude and reactions displayed regarding the topic or the person in the communicative exchange. The receiver of the messages can think the perceived negative reactions are toward them, while the sender is unaware because of the unconsciousness of the responses (Walker, 2016). Additionally, when communication disorders arise with an individual having difficulty speaking, understanding, hearing, or thinking, communication interaction between the sender and receiver can be challenging, and additional biases come to the surface.

An interdisciplinary research modality will integrate research and innovation from several academic disciplines to ascertain phenomena, predict outcomes, and assess responses. The information gleaned can be used to positively impact educational quality and applied to critical societal problems in virtually every field of study. To ensure continuous improvement and responsiveness to evolving community needs, teaching programs informed by AI should be developed using *action research methodology* employing participatory process cycles of planning, action, observation, and reflection (Stringer, 2013). Police departments can collaborate with academic institutions and community groups to co-create and refine training modules. These collaborations ensure that the programs are not only data-informed but also socially and culturally relevant.

4. Anticipated Limitations

There are several anticipated limitations impacting the scholarship of the desired results of the proposed project program. The premise, the instruments, the sample population, the researcher's intervention, and the "success metrics" could all reasonably lead to questions of reliability.

The domain itself lacks substantiated information. The large datasets that are available do not provide the detail sufficient to describe individual incidents and the factors involved, and a fair degree of the information that is provided lacks perspective and may be unreliable. This reality complicates the process of making necessary and subtle distinctions and creates barriers in distinguishing between personal and policy biases (systemic racism).

The methods for measuring implicit associations are indirect and do not lend themselves to real-life experimentation. The instruments are comprised of scenario testing, where results are both qualitative and quantitative. The subjects are aware of the testing during laboratory simulations.

The sample population from which the proposed pilot is to be drawn may not correlate (at least to the same degree described in the research referenced herein) with the ethnic, cultural, or cultural identity of the individuals with whom they interact. Other research projects needed to address the racial disparity in county-level variation (Hehman, Flak & Calanchini, 2018) in both implicit and explicit prejudice, an issue significantly minimized for the proposed pilot.

The overall course goal should be to develop an effective educational design that prepares the students in accordance with the principles and objectives of the research paradigm and adequately addresses the demands of the police force. This affords the Course Instructor considerable latitude to address intervening influences (or variables that may impact a student's learning outcomes when assessing student progress in the course), including, but not limited to, (1) differences in learning and (2) prior educational experiences.

Lastly, a significant limitation of the proposed Pilot program involves the time lag between course completion and the authentic assessment of the students in a real-world application. Authentic assessments require students to be effective performers with acquired knowledge (Wiggins, 1990). Attempts to evaluate a student's mastery of the knowledge and skills necessary may not be possible until post-Pilot and will involve considerable "follow-up" in terms of their ability to solve real-world problems or challenges.

5. Conclusions

Implicit bias presents a formidable challenge to fair and effective policing, necessitating a sustained commitment to comprehensive training and policy reforms. Ongoing research and adaptive strategies are essential for overcoming the unconscious prejudices that undermine law enforcement efforts and community trust.

Efficacy varies among the numerous training programs[21] aiming to reduce implicit bias among law enforcement officers (Lai et al., 2014). Even in those studies that question the efficacy of programs designed to address implicit bias[22], most acknowledge bias training as a utility in an overall strategy. A primary benefit of illuminating the potential impact of implicit social biases is that it invites active participation in remediating problems associated with social stereotypes, discrimination, and prejudice.

Over the years, multiple instances and movements have called for changes in policing practices. Law enforcement agencies continue to evolve, and with them, so do the requirements for becoming a police officer
Police reform is an evolving collection of changes that include eliminating racial profiling, collecting actionable data, reducing officer discretion, and adopting new technologies. These modifications should incorporate the understanding that biased policing occurs in the absence of explicitly "racist" thoughts because of well-documented, pernicious stereotypes that operate largely outside of conscious awareness and control (Glaser, 2024). The role of law enforcement in society requires not only a commitment to justice but also a nuanced understanding of community dynamics, particularly as they relate to issues of race, identity, and power. One critical factor that has emerged recently is *implicit bias*—the subconscious attitudes and stereotypes that influence behavior and decision-making, often without conscious awareness (Greenwald & Krieger, 2006). With the ever-present need for society to remain unified, *artificial intelligence (AI)* offers innovative pathways to transform police and community education. AI-driven teaching programs can support the development of training that is responsive, reflective, and grounded in evidence-based pedagogies. By integrating *differentiated instruction* and AI-assisted technologies, this program will integrate biometric emotion-tracking into VR and experiential training modules, enabling quantifiable analysis of stress, empathy, and emotional regulation in real time. This dual lens of cognitive and physiological data provides a more holistic evaluation of implicit bias interventions, fostering more equitable and favorable police-community interactions.

Author Contributions

Dr. Anthony Mazza is the principal author and Lead PI for the planned experiment.
Dr. Suzanne Lea is a data scientist who provided historical context and research for this paper.
Dr. Tiffany Gurley-Nettles is a speech pathologist who contributed most of the information related to communications and speech issues detailed in this article.
Dr. Annette Miles provided the educational theory used as the framework for the proposed pilot project.
Dr. Niyana Rasayon is a neuropsychologist who contributed the content basis for cognitive measurements and emotional data.

Conflicts of Interest: The authors declare no conflicts of interest. The primary author has identified his familial and personal connections to law enforcement. Drs. Mazza and Lea are subject matter experts in criminology and the US Criminal Justice system.

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[21] A series of studies reported that measures of implicit bias can be reduced (although rarely neutralized) by exposing people to positive examples or media representations from the disadvantaged group (Dasgupta, 2013).
[22] "(T)here are several strands of research that represent promising avenues for further exploration, including intergroup contact, exposure to counter-stereotypic exemplars, and stereotype negation" (Glaser, 2024).

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