

WHEN THEY SEE US: AN INITIAL DEVELOPMENT AND EVALUATION OF A
CULTURALLY RESPONSIVE POLICE INTERACTION TRAINING FOR BLACK
ADOLESCENTS WITH ASD

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DEDICATION

This work is dedicated to Maliyah Rose who taught me that some gifts come wrapped in human form. As I pursue my passion, you are forever my inspiration for reducing health disparities and promoting health equity for all.

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ABSTRACT

The purpose of the current study was to conduct a qualitative and experimental analysis of a culturally informed police safety skills training for adolescents with autism spectrum disorder (ASD). Qualitative focus groups and interviews were used to inform study design, and intervention procedures by exploring perceived barriers to safe interactions with law enforcement officers (LEO), preferred training settings, desired treatment modalities, and culturally appropriate simulated contexts. The current study focused primarily on meeting the unique training needs of Black adolescents with autism spectrum disorder (ASD). A single case design was used to evaluate the initial efficacy and acceptability of a culturally responsive training method. Preliminary evidence about the physiological ramifications of police contact were also collected to begin to examine the broader behavioral and psychophysiological nature of youth's experiences. Understanding whether police interactions led to changes in adolescents' cortisol and heart rate variability provided insight into the physiological costs of police presence among Black adolescents with ASD. The current project is innovative and novel in that it used the integrated perceptions and knowledge of Black caregivers, Black adolescents, and local law enforcement to develop training methodology based on local norms. No police-focused study has yet to consider the integral aspect of anxious behaviors and social abilities in ASD youth. The current experimental design included in-person simulated contexts that youth, and caregivers, endorsed as relevant to their normal lives, which greatly strengthened the ecological validity of the approach.

CHAPTER I: INTRODUCTION

Background

The Bureau of Justice Statistics (BJS; Hyland et al., 2015) reported that an annual average of 279,900 youth per year (aged 16-25 years old) experienced the threat, or use, of nonfatal force during their most recent contact with law enforcement officers (LEO). Specifically, this study found that 2.6 percent of youth interactions with LEOs would escalate, resulting in youth being more likely to experience confrontational interactions with LEOs than individuals 26 and older (Hyland et al., 2015). BJS highlights the use of force among youth populations 16-25, but the intersectional disadvantage of disability is often left unaddressed. More importantly, the prevalence of law enforcement contact (i.e., street or emergency related interaction without force) among ASD populations is not currently reported at the national level. Addressing this gap, recent studies highlight the prevalence of LEO contact ranges from 6 to 21% for adolescents and adults with autism spectrum disorder (ASD) and LEOs (i.e., Rava, Shattuck, Rast, & Roux, 2017; Tint, Palucka, Bradley, Weiss, & Lunksy, 2017; Turcotte, Shea, & Mandell, 2018).

A growing body of research exist examining individuals with ASD, criminal activity, and LEO involvement (King & Murphy, 2014; Robertson & McGillivray, 2015; Rava et al., 2017; Tint et al., 2017; Turcotte, Shea, & Mandell, 2018). Yet, the phenomenon and incidence of LEO contact among ASD populations is a new emerging branch of research in this area. Rava and colleagues (2017) estimated that approximately 20% of 920 youth with ASD had interacted with LEOs by the age of 21 and found that youth with externalizing behaviors demonstrated an increased likelihood of law

enforcement interaction without criminal convictions. Tint and colleagues (2017) found that approximately 16% of 284 sampled adolescents and adults with an ASD were reported to have experienced some form of LEO involvement during the study period.

There is an emerging body of literature that evaluates how ASD symptoms and populations are at risk for LEO contact/involvement (Cheely et al., 2012; Rava et al., 2017; Tint et al., 2017; Turcotte et al., 2018). ASD youth are significantly more likely to have a variety of common presenting concerns (i.e., physical aggression towards others in community or home, medical emergency, elopement, self-injury, etc.) that may increase their likelihood of contact with LEOs. Adolescents and young adults with ASD have been shown to be at increased risk for LEO contact as a result of co-occurring psychiatric and medical comorbidities (Croen et al., 2015; Taylor et al., 2019) and associated problem behaviors (i.e., aggression or elopement; Anderson et al., 2012; Mazurek, Kanne, & Wodka, 2013). In a recent study, being male and having externalizing behaviors emerged as a significant predictor of adults and adolescents with ASD reporting LEO contact (Rava et al., 2017). According to Tint and colleagues (2017), adolescents and young adults with ASD that necessitated LEO involvement were more likely to display aggressive behaviors that required LEO assistance, be older in age, have a history of aggression, live outside of the family home, and have parents with higher rates of caregiver strain and financial difficulty at baseline. In comparison to other adolescents and adults without disabilities, the aforementioned predisposing factors were associated with those with ASD being vulnerable to being stopped and/or arrested by LEOs (Griffiths et al., 2019; Lunskey, Paquette-Smith, Weiss, & Lee, 2015).

The Centers for Disease Control (CDC) estimates one in every 59 individuals (1 in 37 boys and 1 in 151 girls) has been diagnosed with an ASD in the general population (CDC, 2018). ASD is a neurodevelopmental disorder that is characterized by persistent impairments in social communication, social interactions, and restricted/repetitive patterns of behavior (American Psychological Association; APA, 2013). Individual characteristics, including the core characteristics of ASD, may lead to increased contact with law enforcement either as victims or perpetrators (Freckelton and List, 2009; Mayes, 2003; Salseda et al., 2011; Woodbury-Smith et al., 2005).

According to Simonoff and colleagues (2008), approximately 70% of ASD youth within their sample had a comorbid psychiatric disorder and 41% had two or more co-occurring disorders. Past studies have found that ASD adolescent and adult populations may present with multiple co-morbid conditions, including anxiety, depression, oppositional and conduct problems, attention deficits and hyperactivity, intellectual disability, motor difficulties, epilepsy, schizophrenia, personality disorders, and a plethora medical concerns (Davignon, Qian, Massolo, & Croen, 2018; Lever & Geurts, 2018; Muskens, Velders, & Staal, 2017; Simonoff et al., 2008; Strang et al., 2012; White, Oswald, Ollendick, & Scahill, 2009; Wise et al., 2017). Additionally, visual or auditory sensory sensitivity to certain displays of light and noise occur in this population (Marco, Hinkley, Hill, & Nagarajan, 2011). Adding to the existing complexity of the common comorbid presentation, individuals with ASD may also have impairments in theory of mind and social abilities (Boucher, 2012; Maddox, Miyazaki, & White, 2017; Moran et al., 2011). In turn, causing individuals on the autism spectrum to present as unusual and inappropriate during a variety of social situations due to their clinical characteristics.

ASD is defined as a neurodevelopmental disorder that results in lifelong “invisible” disability and has been shown to impact multiple domains of development among adolescent populations (Woodman, Smith, Greenberg, Mailick, 2015; Wright, Wright, D’Astous, & Wadsworth, 2016). During adolescence, ASD symptoms have been shown to impair youth’s ability to socialize with others, have social problem-solving skills, learn new skills, regulate their emotions, and adapt to new novel environments and social contexts (Dovgan & Mazurek, 2018; Goldsmith & Kelley, 2018; Taylor, Adams, & Bishop, 2017). Freeth and colleagues (2011) found that adolescents with ASD were significantly slower, than typically developing same-age peers, at fixing their eyes upon social stimuli (i.e., a person and their face). Individuals with ASD commonly have difficulties with exhibiting the appropriate social skills across contexts. Difficulties in social skills are a core component of the disorder, and may include an absence of social reciprocity, a poor display of eye contact and facial expressions, a lack of nonverbal behaviors and gestures, and difficulty acquiring and maintaining peer relationships. As such, a growing number of interventions have been employed to improve specific social communication and interaction skills for individuals with ASD across the lifespan (Reichow & Volkmar, 2010; White, Keonig, & Schail, 2007; Wong et al., 2015). The extent to which social skills programming has accounted for ASD populations interacting with LEO, both nationally and internationally, has not yet been examined.

Of the co-morbid symptoms and conditions, anxiety is the most problematic condition that could impact youth’s social interactions with LOEs (Buhr and Dugas, 2009; Carleton, 2012; Keefer et al., 2017; Neil, Olsson, & Pellicano, 2016; South, Rodgers, & Hecke, 2017). Vasa and Mazurek (2015) found that co-morbid rates of

anxiety disorders in ASD range from approximately 20-80%. Specifically, anxiety has been noted as a potential mediator for ASD individuals' functioning in the following domains: facial expression processing, behavioral regulation, decision making, and psychophysiological arousal in reaction to social threat (Chiang and Gau, 2015; Kleinhans et al., 2010; Klusek et al., 2015; LeDoux and Pine, 2016; Luke, Clare, Ring, Redley, & Watson, 2012; Samson et al., 2015; South et al., 2017). Recently, Goldsmith and Kelly (2018) found that poor emotional regulation was related to the exasperation of the following ASD symptoms: poor social functioning, repetitive behaviors, elevated physiological arousal, and greater sensory related sensitivity. Even though absent from ASD and law enforcement literature, these potential contributing risk factors require further exploration in this subarea of research.

Statement of the Problem

BJS highlighted the use of force among the overall youth population; however, the intersectional disadvantage of disability and race is left unaddressed. Recent studies suggest the prevalence of LEO contact with adolescents and adults with ASD ranges from 6 to 21% (Rava et al., 2017; Tint et al., 2017; Turcotte et al., 2018). A compounding risk factor is that Black and Latinx youth are at higher risk of general police contact and use of force (Hyland et al., 2015; Thomas & Blackmon, 2015). Specifically, Black youth are a particular racial subgroup disproportionately linked to higher rates of LEO profiling, contact, and related mortality (Badolato et al., 2020; McLeod et al., 2020). According to the CDC, Blacks make up 13% of the United States (US) population yet comprise 23% of lethal encounters with LEOs nationally (Mapping Police Violence, 2019). Notably missing from the current understanding of the police interaction literature

is the examination of these deleterious experiences among those who have intersectional social identities (i.e., race and disability). For decades population-based, cross-sectional, and qualitative explorations have outlined the Black community's burdened experiences with law enforcement (Chaney & Robertson, 2015; Hirschtick et al., 2020; Hollis & Jennings, 2018; Paoline, Gau, & Terrill, 2018). Kwate and Goodman (2015) utilized a design to assess whether the occurrence of police profiling/interaction was intersectionally different due to race, gender, and socioeconomic status (SES). Consistent with English and colleagues (2017), the findings supported that Black men, rather than women, were the most frequent targets of police related discrimination when controlling for SES.

Relevant predisposing/precipitating factors for police contact have emerged for those who are Black adolescents and young adults: higher police presence and intervention within both suburban and urban schools, negative vicarious narratives about law enforcement, "proactive" policing tactics being implemented in community "hot spots", living in high crime neighborhoods that are unfairly vulnerable to racially disparate aggressive policing practices (Geller & Fagan, 2019; Weisburd et al., 2014; Weisburd et al., 2016). Campos-Manzo and colleagues (2018) extended the growing body of research by sharing the gendered and racialized aggressive policing experiences that occurred in both "high surveillance" and "officer friendly" neighborhoods (i.e., predominantly minority vs. White spaces) amongst "nondelinquent" Black and Latinx adolescents. Little attention has been focused on investigating the intersectional experiences of Black adolescents and young adults with ASD. Presently, a significant gap in ASD research is the inability to include, and highlight the experiences of, the most

socially vulnerable: Black adolescents and young adults with ASD (Copenhaver & Tewksbury, 2019; Davenport et al., 2018).

Besides race and gender, there are many reasons that LEO interactions may be challenging for male youth with ASD. Predisposing co-occurring conditions or symptoms (i.e., anxiety, sensory difficulties, medical issues, speech/language delays) may increase the likelihood of maladaptive reactions to LEO contact (Choueiri & Zimmerman, 2017; Ponde, Matos, & de Oliveira, 2017; Veatch et al., 2017; Wise, Smith, & Rabins, 2017). Precipitating circumstances that may cause negative encounters with LEOs may include youth having an existing fear of a person in uniform, poor perspective taking skills, and restricted interests in the various objects or equipment that a LEO wears (Jayaraman & Mundkar, 2017; Maynard, 2019; Young & Brewer, 2019). Much of the research on examining LEO interactions with individuals with ASD has focused on training LEO to respond to individuals with ASD (Gardner & Campbell, 2020; Love et al., 2020; Railey et al., 2020)). Very little research has focused on developing intervention pathways for adolescents and adults with ASD to respond to LEO. That is, much of the research in this area has focused on LEO rather than the individuals with ASD. Yet, potential challenges may perpetuate undesirable situations between youth with ASD and LEOs: a heightened “fight-or-flight” response, not complying with certain commands like “stop”, avoiding eye contact which may make them appear suspicious, engaging in repetitive behavior or sudden movements, and an inappropriate response to a disrupted routine (Cibralic et al., 2019; Cuve et al., 2018; Gardner et al., 2019).

Training supports for youth with ASD are warranted and must account for behavioral and developmental risk factors might make them more vulnerable during

police contact than their typically developing counterparts (Gardner et al., 2019).

Although police interaction curriculum exists for individuals with ASD, there is minimal evidence to support their efficacy (e.g., Be Safe, 2018). To date, only one experimental evaluation of a virtual reality (VR) delivered police interaction training has been initiated, aiming to compare BE SAFE to the VR method (FLOREO; Parish-Morris et al., 2018). Parish-Morris and colleagues (2018) are still actively recruiting for their clinical trial, however they have published initial social validity findings.

Current Study

The current law enforcement use of force epidemic highlighted by the Department of Justice calls for future “strategic science”. ASD researchers are capable of filling knowledge gaps that can inform adapted training programs for, and policy changes in, communities and schools related to preparing youth and young adults with ASD to interact with law enforcement. Identifying and targeting individual behaviors are vital in addressing common ASD symptoms or behaviors youth may engage in during a social-based encounter with law enforcement. However, elucidating individual factors, such as physiological arousal and anxiety, that precipitates law enforcement contact with ASD youth and adult populations is paramount.

There remains a need for establishing evidence-based interventions, particularly culturally appropriate police interaction training supports that account for the unique sociocultural factors (i.e., structural racism) that historically impact youth and their families (Trent et al., 2019). The purpose of the current study was to: (a) develop, and evaluate the preliminary efficacy of, a culturally responsive police safety skills training model with Black adolescents with ASD using a multiple baseline design across

participants, (b) determine the treatment impact on secondary outcomes, including self-reported stress and biological/physiological arousal (i.e., salivary cortisol levels and heart rate variability), and (c) examine whether the acquired law enforcement interaction skills and psychophysiological outcome gains are maintained after treatment. Purpose of the

CHAPTER II: LITERATURE REVIEW

Autism and Law Enforcement

Involvement in the criminal justice system (CJS) is defined as an individual's role as the offender, or witness, within the following contexts: community arrests, interrogation interviews, criminal court trials, and imprisonment (i.e., juvenile and adult facilities). Many risk factors may lead to individuals with ASD being involved in the CJS, including co-morbid psychiatric disorders (i.e., psychosis and personality disorders), lack of understanding social situations, impairments in moral reasoning, emotional dysregulation, obsessional interests, disturbance caused by disruption of routines and failure to recognize the potential consequences of their behavior (Allen et al., 2008; Freckelton & List, 2009; Howlin, 2004; King & Murphy, 2014; Lerner et al., 2012; Mouridsen, 2012; Wing, 1981). For example, Salseda and colleagues (2011) evaluated the delivery of Miranda rights and interrogation tactics with youth and adults with ASD. Results of this review found that LEOs across the United States often used Miranda rights that varied in reading level, length, content, delivery (i.e., oral and written). This past review also highlighted that language deficits, poor social skills, and stereotypical behaviors may reduce individuals' level of Miranda comprehension and increase vulnerability to interrogation techniques (Salseda et al., 2011).

Considering the primary focus on the criminal conviction and profiles of youth and adults with ASD within the CJS (i.e., King & Murphy, 2014; Langstrom et al., 2009; Ledingham & Mills, 2014; Mouridsen, 2008; Newman & Ghaziuddin, 2008; Sondenaa et al., 2014; Woodbury-Smith, 2014), research has recently shifted to examining the prevalence and risk factors for LEO contact among ASD populations. Cheely and

colleagues (2012) evaluated a sample of 609 (44% typically developing and 56% ASD youth) South Carolina native youth, and they found that 32 (5%) of ASD youth had been charged with a total 103 offenses. This study spurred other investigators to explore the prevalence of ASD youth experiencing LEO contact beyond that related to criminal involvement.

Prevalence of Law Enforcement Contact

In the context of the current study, LEO contact is defined as individuals being stopped, questioned, or requiring LEO involvement after an emergency call or visit. Tint and colleagues (2017) found that 16% of 284 parents in Canada reported that their adolescent and adult children with ASD had contact with LEOs during the 14-month study period. Similarly, Rava and colleagues (2017) found that nationally sampled US parents reported approximately 20% of 920 transitioned-age youth with ASD were reported to have been stopped and questioned by the LEOs by 21 years old (50% of those by 15 years old), and nearly 5% had been arrested. Turcotte, Shea, and Mandell (2018) surveyed 2525 Pennsylvania caregivers of youth (6-17 years old) with ASD and found that 7.9% of the overall sample, 14.3% of those 13-17 years old, and 4.1% for those 6-12 years old, had law enforcement contact not related to criminality.

ASD-Focused Training Supports for Law Enforcement

An evidence-base has emerged in more recent years to guide law enforcement perceptions of, and the policing of, youth and adults with ASD (Crane, Maras, Hawken, Mulcahy, & Memon, 2016; Maras & Bowler, 2014; Matson & Cervantes, 2014). For example, Teagardin, Dixon, Smith, & Granpeesheh (2012) conducted a randomized trial of a law enforcement training on ASD with 82 LEOs that significantly improved officers'

knowledge but their post-training scores did not demonstrate mastery. In addition, Stokoe (2013) developed a simulated role play procedure, Conversation Analytic Roleplay Method (CARM), to help LEOs to improve their interactions with ASD individuals suspected of committing a crime. ASD specific training was purposed to teach LEOs how to identify an individual with ASD, understand ASD symptomology, provide supports during ASD individuals' participation in the CJS, and appropriately respond using behavioral and crisis intervention training strategies. Kelly and Hassett-Walker (2016) reported common strategies that New Jersey in-service trainers used for improving first responders' ASD awareness: reading and signing state mandates (6.1%), video-based instruction (13.6%), internet-based training modules (23.8%), hired in-person speakers or instructors (24.5%), and a combination all the approaches (28.6).

Despite the increased training of LEOs internationally, past research has noted discrepancies between law enforcement reports of readiness for interacting with ASD individuals and their current policing practices (Crane et al., 2016; Dando, Wilcock, Milne, & Henry, 2009). For example, Crane and colleagues (2016) used surveys to explore the perspectives of approximately 400 LEOs to examine how competent they feel about their policing of individuals with ASD, and ASD community (31 adults with ASD and 49 parents) were asked about their satisfaction with their experiences with law enforcement. 42% of LEOs were satisfied with their current professional conduct with the population (Crane et al., 2016). Contrary to law enforcement report within this sample, 69% of adults with ASD and 74% of parents reported overall dissatisfaction with LEOs lack of awareness and knowledge of ASD, the needs of individuals with ASD (i.e., physical and emotional), interrogation practices, delays informing defendants and

witnesses about what is happening, and neglecting to contact and consult with the individual's family members (Crane et al., 2016).

An Intersectional Framework

Intersectionality of disability (i.e., ASD) and race has yet to be examined in the area of ASD and law enforcement contact, particularly among those adolescent youth without criminal behavior prompting law enforcement contact. The term intersectionality was originally introduced by Crenshaw (1989, 1991) around the dimensions of race and gender, and how legal policies failed to adequately account for the lived experiences and types of discrimination that black women often experienced. Other intersectional theorists Collins (2000) and Choo and Ferree (2010) challenged the universalized racial and gendered research, related to feminism and critical race theory, positing white women often represent the category of women and black men often represent the category of Black.

Intersectionality is a framework that allows researchers to examine an increasingly wider range of processes and identities (Frederick & Shifrer, 2018). Despite the prevalence of Black youth experiencing law enforcement contact and brutality (Hyland, Langton, & Davis, 2015), past research has focused on those within the ASD community has focused on the prevalence of law enforcement contact with young White males with ASD from educated, middle class, and married households (Cheely et al., 2012; Rava et al., 2017; Tint et al., 2017; Turcotte et al., 2018). Federal, state, and local law enforcement agencies are not required to report instances of law enforcement contact or brutality against individuals with disabilities, and no national database currently monitors these patterns besides media outlets (Perry and Carter-Long, 2016; Ross, 2015).

Therefore, it's vital that researchers exploring this occurrence within the ASD community sample diversely in order to recognize these underlying patterns.

Black Youth and Law Enforcement

A specific subgroup of youth that have been increasingly at risk are Black adolescents; given they have been found to have more contact with the law enforcement than other racial groups. For example, according to Hyland and colleagues (2015) Black youth (3.5%) were 2.5 times more likely than white youth (1.4%) and 1.7 times more likely than Hispanic youth (2.1%) to experience the threat or use of nonfatal force. Hyland et al. (2015) also highlighted that Blacks (1.6%) were more likely than Whites (0.6%) to experience verbal force, and a higher percentage of Blacks (1.6%) experienced physical force than Whites (0.7%) or Hispanics (0.9%). Evidence suggests that some Black youth may have come to expect confrontational interactions with LEOs (Carr, Napolitano, & Keating, 2007; Fine et al., 2003; Hinds, 2007). For example, Brunson and Miller (2007) examined law enforcement interactions among 40 young Black men (i.e., ages ranging from 13 to 19; mean age of approximately 16) living in a St. Louis neighborhood. They found their participants consistently reported dissatisfaction with, and distrust of, local law enforcement. Their participants also reported feeling harassed by the law enforcement and experiencing a range of additional negative encounters with LEOs. These experiences may lead to negative perceptions of law enforcement encounters.

Thomas and Blackmon (2015) evaluated parent perceptions of law enforcement force against Black male youth. They found that Black parents responded with a need to keep their children safe. Additionally, Black parents responded with greater concern for

boys and they identified them as more at risk. Parents reported that this often times led to specific racial socialization discussions on how to cope with racism and being confronted by the law enforcement (Thomas & Blackmon, 2015). Interviews with minority youth in urban settings indicated that the sampled youth didn't feel secure in the presence of the law enforcement (Lee, Steinberg, & Piquero, 2010). In addition, Stagger-Hakim (2016) conducted focus groups and found that Black youth would speak with their families about ways to have safe encounters with law enforcement. These boys also indicated that they were aware that law enforcement could easily assume that they were a suspect and that the encounter could easily escalate (Stagger-Hakim, 2016). Also, past studies have shown that minority suspects were significantly more likely to engage in behaviors that were perceived as noncompliant than those who are Caucasian when the arresting officer was Caucasian (Bierie, 2015; Belvedere et al., 2005; Engel, 2003). Violent and confrontational interactions between law enforcement and Black youth are complex problems with varied causes and opportunities for solutions (Ross, 2015). For example, strategies to improve these interactions need to occur at the individual, relational, and structural (i.e., combatting structural racism) levels.

A recent examination of National Health Interview Survey (NHIS) data (from 2014-2016) indicated that the prevalence of ASD in the US was 1.82% among Hispanic children, 2.49% among non-Hispanic Black children, and 2.48% among those classified as other, compared to 2.77% among non-Hispanic White Children (Xu, Strathearn, Liu, & Bao, 2017). Due to increased rates of ASD and law enforcement involvement with disability populations, LEOs are interacting significantly more with the ASD population, as well as those who are Black with ASD. Consequently, increasing the likelihood for a

negative interaction with those at the intersection of Black and disability. For example, in 2014 Reginald Latson was a young Black adolescent with co-occurring ASD and intellectual disability who was stopped by a LEO due to a case of mistaken identity following a robbery that occurred in Virginia (Sutton, 2017). After being approached suddenly by law enforcement, Reginald responded aggressively and assaulted a law enforcement officer. He recently has been released from prison and placed within a mental health facility, but only years after enduring abuse within the prison system. Reginald is one practical example of an increasing issue law enforcement contact with individuals at the intersection of disability and race (i.e., young black men with ASD). The associated phenomenon among Black adolescent youth requires further investigation within the Black ASD population that is often minimally represented in past ASD and law enforcement related research (Rava et al., 2017; Tint et al., 2017; Turcotte et al., 2018). As a result, the current study focuses primarily on solutions for ASD adolescents (i.e., containing only a subpopulation of Black youth) at the individual and relational level.

The media often reports negative or tragic interactions between LEOs and individuals with ASD (Cheely et al., 2012). Some tragedies, such as the shooting of Paul Childs by LEOs in Colorado, have sparked pivotal state legislation in support of specialized training for law enforcement (Osborn, 2008). Yet, others who are racial/ethnic minorities and low household income level, like Reginald Latson, are nonexistent within current policies and research on law enforcement contact (Sutton, 2017). The current ASD research literature in the area of law enforcement contact has a multitude of limitations: doesn't address and explore the intersectionality of disability

and race, poor sampling methods, primarily epidemiological studies, and intervention research has yet to occur. More specifically, the current study seeks to deliberately explore the intersectionality of individuals with an ASD experiencing law enforcement contact and address the unmet call for teaching specific social skills to prepare individuals with ASD for potential contact with LEOs.

Contributing Factors to Consider During Law Enforcement Contact

Environmental Factors. Past research has highlighted that individuals with ASD aggressing in emergency service locations led to law enforcement contact/involvement (Kalb et al., 2012; Lunskey et al., 2015; Mandell, 2008). Law enforcement contact is also likely to occur when LEOs are called to resolve a mental health or behavioral crisis (de Tribolet-Hardy et al., 2015; Short et al., 2014), particularly in the form of crisis intervention teams (CIT; Franz and Borum, 2011; Compton et al., 2008). Similarly, Tint and colleagues (2017) found that their sample who had law enforcement contact was more likely to have the following characteristics at baseline: history of aggressive behavior, reports of caregiver strain, older in age, live outside of the family home, without structured day and activities, no family involvement, and poor service use. In addition they were found to report older age, lack of supervision, and externalizing behaviors correlating with increased law enforcement contact. Rava and colleagues (2017) also found that transitioned-aged females with ASD were significantly less likely to have law enforcement contact. Interestingly, Turcotte, Shea, and Mandell (2018) participants with the following clinical and demographic characteristics were more likely to have law enforcement contact: classification of Asperger's disorder, middle income

category (\$40,000-\$79,000), unmarried parents, experienced school disciplinary action, hospitalization, and co-occurring diagnoses of ADHD and conduct disorder.

Tint and colleagues (2017) highlighted the need to improve community-based family supports to reduce service utilization and family burden related risks for law enforcement contact. In addition, researchers have stressed the practical relevance of the “service cliff” that occurs when individuals with ASD become adults (i.e., Cheak-Zamora & Teti, 2015; Cheak-Zamora, Teti, Maurer-Batjer, & Koegler, 2017; Shattuck et al., 2011; Turcotte et al., 2016). Rava and colleagues (2017) emphasized the need for community and school-based interventions for transitioned-aged youth in order to reduce misconceptions and increase effective communication when youth interact with LEOs. Turcotte and colleagues (2018) highlighted the need for future policy and research to identify the sequencing of the three correlated events (i.e., school discipline, hospitalization, and law enforcement contact) and prioritize the development of screening and intervention (i.e., addressing externalizing behaviors and social competence deficits) efforts within the care system to prevent these law enforcement related events.

Externalizing Factors. Externalizing symptoms are defined as aggression, self-injury, hyperactivity, attention difficulties, disruptiveness, non-compliance, and rule-breaking behaviors (Baker & Blacher, 2015; Baker et al., 2017; Kanne & Mazurek, 2011). Totsika and colleagues (2011) notes that 85% of ASD youth with ASD, and without intellectual disability, had hyperactivity and 64% had conduct problems. Furthermore, they found that having an intellectual disability and ASD increased the rates of hyperactivity and conduct problems (i.e., 88% and 65%). In relation to difficulties sustaining attention and displaying hyperactivity characteristics, attention-

deficit/hyperactivity disorder (ADHD) is a common co-occurring disorder affecting approximately 16 to 80% of youth with ASD (Baker & Blacher, 2015; Hanson et al., 2012; Llanes, Blacher, Stavropoulos, & Eisenhower, 2018; Van der Meer et al., 2012).

Relative to behavior and conduct problems, Matson and colleagues (2009) found that the prevalence was approximately 25% of ASD youth had a co-occurring disruptive behavior disorder. Mazurek and colleagues (2013) found that youth with ASD who were aggressive had higher levels of both receptive and expressive abilities. It also appears within the ASD literature that pragmatic language difficulties have been found to be associated positively with externalizing behaviors (Boonen et al., 2014). Shea, Payne, and Russo (2018) highlighted that targeting social difficulties in ASD populations may be the underlying issue that increases the severity of externalizing behaviors. More specifically, they examined whether social abilities predicted externalizing behaviors in 29 individuals with ASD (7-16 years old) compared to those who were typically developing peers (Shea et al., 2018). Social skills scores accounted for 50% of the variance in the externalizing behaviors that were reported for individuals with an ASD (Shea et al., 2018).

Internalizing Factors. Internalizing symptoms are defined as feelings of withdrawal, somatic complaints, and feelings of anxiety and depression (Adams, Fredstrom, Duncan, Holleb, & Bishop, 2014). Depression (approximately 12.3-48.6%) is among many co-occurring symptoms that are very common in populations with ASD (Hudson, Hall, & Harkness, 2018). ASD youth without an intellectual disability, particularly emerging adults, are susceptible to anxiety and depression due to transition specific stressors (Caamano et al., 2013; Ghazziuddin and Zafar, 2008; Matilla et al., 2010). Totsika, Hastings, Emerson, Lancaster, and Berridge (2011) found that

approximately 74% of ASD sample (5 to 16 years old), without intellectual disability, had clinically significant levels of emotional problems compared to much lower rates in a typically developing group (approximately 18% had emotional problems).

Kerns and colleagues (2014) found that their participants displayed both a traditional (approximately 48% of their sample) and an atypical (approximately 15% of their sample) presentation of anxiety disorders; highlighting a unique manifestation of anxiety that may occur in ASD youth populations. They defined traditional anxiety disorders as a presentation consistent with DSM criteria, and atypical anxiety as symptomology that is uniquely found in ASD populations that drifts from DSM criteria.

Davis and colleagues (2011) found that children with ASD (age 2-14 years) who had higher verbal communication and structural language ability experienced more anxiety. In relation to pragmatic language, past studies have found that youth who had difficulty with turn-taking in conversations and pragmatic language experienced more internalizing symptoms as well (Boonen et al., 2014; Hallett et al., 2010). In a recent study by Rodas, Eisenhower, Blacher (2017), it was found that structural language in ASD youth was a positive longitudinal predictor of co-occurring anxiety symptoms.

Anxiety disorders are prevalent in about 40% of youth under the age of 18 (Jennett et al., 2013; Kern et al., 2014). Similarly, White, Oswald, Ollendick, and Scahill (2009) highlighted that between 11% and 84% of youth with ASD had experienced some form anxiety that interferes with their daily functioning. With the known comorbidity of anxiety and ASD symptoms, it is important to discuss the relevance of emotional regulation within this population (Weiss, Thomson, & Chan, 2014). Emotional regulation

can be defined as the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions to accomplish one's goal.

In relation to emotional regulation difficulties, individuals with ASD are known to present with impairment in the following domains (Bal et al., 2010; Bolte, Feineis-Matthews, & Poustka, 2008; de Bruin, Zijlstra, & Bogels, 2014; Channon, Charman, Heap, Crawford, & Rios, 2001; Embregts & van Nieuwenhuijzen, 2009; Gotham et al., 2013; Howlin, Goode, Hutton, & Rutter, 2004; Lawson, Baron-Cohen, & Wheelwright, 2004; Samson et al., 2015): (a) situation selection (i.e., understanding social, unstructured, or novel situations), (b) situation modification (i.e., impaired naturalistic problem solving and poor coping abilities in response to stressors), (c) attentional deployment (i.e., difficulties with emotional recognition; focusing on negative or irrelevant information; and atypical physiological responding to emotional stimuli), (d) cognitive change (i.e., tendency to ruminate, cognitive distortions, and suppression), and (e) response modulation (i.e., hyperarousal to emotionally aversive situations that may inhibit emotional regulation).

Intolerance of uncertainty has been defined as an individual's negative perceptions of uncertain situations, resulting in high levels of stress, worry, and avoidance (Dugas et al., 1998). Cai, Richdale, Dissanayake, Ujarevic (2018) recently examined the relationship between emotional regulation, intolerance of uncertainty, anxiety, and depression among 61 individuals with ASD (aged 14-24). Within this population, intolerance for uncertainty was found to be related to increased habitual use of suppression relative to appraisal and higher symptoms of anxiety and depression (Cai et al., 2018). This was consistent with past findings that intolerance for uncertainty

predicted internalizing symptoms (i.e., Boulter et al., 2014; Maisel et al., 2016; Samson et al., 2015) and maladaptive emotional regulation strategies (i.e., suppression or rumination; Yook et al., 2016). This study highlighted the interrelatedness of intolerance of uncertainty and emotional regulation and described the importance of measuring emotional regulation longitudinally rather than one time point only.

Physiological Factors. Past studies have established that individuals with ASD have abnormal levels of various hormones. Particularly among this population, higher levels of cortisol occur in response to psychosocial stressors (i.e., interactions with others; Buske-Kirschbaum et al., 1997; Corbett et al., 2010; Corbett et al., 2012; Corbett, Muscatello, & Baldinger, 2019; Schupp et al., 2013; Spratt et al., 2012). Cortisol is an integral measure of an individual's biological stress response that is the byproduct of the psychoneuroendocrine systems, hypothalamic-pituitary-adrenal (HPA) axis (Heinrichs and Koob, 2004; Woda et al., 2016). Moreover, cortisol measured in blood, saliva, and urine have all been shown to be highly correlated with each (Goodyear et al., 1996), with particularly higher agreement between blood and saliva methods (Kirschbaum & Hellhamer, 2000). Spratt and colleagues (2012) found that children with ASD 3-10 years old, in comparison to same age peers, had notably higher levels of cortisol due to the blood draw method. This stress inducing method for collecting cortisol has led to the increased use of a less invasive approach (i.e., salivary collection) for those with ASD (Lounds & Corbett, 2014).

Heart rate (HR) and heart rate variability (HRV) are physiological measures that can be used for assessing the presence of stress or even of the elevated levels of autonomic arousal (Chalmers, Quintana, Abbott, & Kemp, 2014; Daluwatte et al., 2013;

Kushki, Brian, Dupuis, & Anagnostou, 2014; Ming, Julu, Brimacombe, Connor, & Daniels, 2005; Pittig, Arch, Lam, & Craske, 2013). Three studies also used physiological measures (i.e., HR and HRV) to assess response modulation (Van Hecke et al., 2009; Bal et al., 2010; Neuhaus, Bernier, & Beachaine, 2016). Recent research has shown that HR anomalies exist within ASD populations. Specifically, ASD populations typically have higher baseline HR than typically developing populations (Daluwatte et al., 2013; Kushki et al., 2014). Past research has highlighted that HRV is a promising biomarker for various anxiety disorders (Friedman, 2007; Pittig et al., 2013). Also, a past study highlighted its utility in assessing stress regulation while placing participants in various social contexts (Alvares et al., 2013). HR and HRV have been valuable objective measures of emotional regulation across other area of study within the anxiety and ASD literature. The use of both behavioral and physiological measures (self-report, observation, and physiological) allows for discrepancies to be determined between youth's self-report, observed behavior, and physiological response to specific stimuli (i.e., LEOs; Corbett et al., 2009; Hufnagel, Chambers, Bertrand, & Dutheil, 2017; Spratt et al. 2012).

Theoretical Underpinnings of the Current Study

Social Learning Theory. According to Bandura (1977), social learning is defined as a new pattern of behavior that is acquired by an individual through direct experience, or by observing the behavior of others within their environment. Bandura (1977) presented that there may be an established distinction between the factors influencing social learning like direct experience, various forms of reinforcement (vicarious, self, etc.), modeling and stimulus-response contingencies, stimulus control, cognitive control, and environmental cues and reward contingencies. More specifically, the evaluative

portion of the current study included modeling to help adolescents efficiently and effectively learn and emit the safety skills required for them to interact safely with law enforcement in the community they live. The safety behaviors associated with the context of law enforcement contact were quantified and measured, in order to monitor their progress in acquiring new behavioral skills over time.

Habituation. Thompson and Spencer (1966) outlined the foundational characteristics of habituation. Asserting the primary principle that nonasscoaitive learning can be facilitated by particular stimulus eliciting a response that can be decreased after repeated exposures to the stimulus. In the context of the current study, habituation referred to the process by which the magnitude of HPA activation occurring in response to a stressor declines with the repeated exposure to the same stressor (Grissom & Bhatnagar, 2009). Adolescence is a developmental period that yields considerable changes in HPA functions and longer lasting stress responsiveness, when compared with the functional effects of stress on adults (Romero, 2013). Corbett, Muscatello, and Baldinger (2019) found that social context influenced the extent to which children with ASD (10-12 year olds) demonstrated anxiety symptoms and greater cortisol stress response. Furthermore, an inaugural study found cognitive behavioral or behavioral strategies facilitated greater cortisol habituation among adolescents and young adults (Manigault et al., 2019). Although the aforementioned study did not collect cortisol samples prior to participants entering the laboratory (i.e., assessment anticipatory stress response), the results highlighted the potential of a brief 6-week cognitive re-appraisal manipulation or mindfulness activities (45-60 minutes) can improve coping strategies and modulate cortisol responses to social stress (Manigault et al., 2019).

Modal Model of Emotional Regulation. Gross and Thomson's (2007) modal model of emotional regulation is a relevant framework for guiding the importance of the present study. More specifically, this model includes five domains of emotional regulation processes: (a) situation selection, (b) situation modification, (c) attentional deployment, (d) cognitive change, and (e) response modulation. Situation selection is defined as understanding a specific situation, predicting the probable outcomes, and evaluating the consequences of responding adaptively (i.e., avoiding potentially dangerous situations) or maladaptively (i.e., avoiding safe situations or responding inappropriately during unsafe situations). Situation modification is the ability to alter a situation in order to regulate potential emotional responses. Attentional deployment is the ability to control the way that attention is allocated to or away from the emotion eliciting aspects of a situation. Cognitive change is modifying emotional reactions through appraisals of a situation and the capacity to cope with it. Response modulation is defined as the continuum of physiological and behavioral ways of regulating and expressing emotions after they are experienced. The goal current study was a direct assessment of ASD adolescents' ability to use adaptive strategies to assist them in reducing maladaptive behavioral responses during interactions with LEOs. So, this model of emotional regulation lends itself as a useful framework to justify the progress monitoring of the emotional and behavioral ways that adolescents respond to the presence of LEOs.

Safety Skills Trainings for Youth with ASD

There is an existing body of research focused on teaching other relevant safety behaviors using Behavioral Skills Training (BST). BST is an applied behavior analytic training framework that has been used to teach various safety skills (i.e., gun safety,

sexual abuse prevention, soliciting help when lost, responding to bullying, etc.) to many different populations (i.e., children with and without ASD, adults with ASD and other disabilities; Miltenberger, 2008; Miltenberger, Roberts, Ellingson, & Galensky, 1999; Pan-Skadden et al., 2009; Sanchez & Miltenberger, 2015; Stannis, 2015; Travis & Sturney, 2013). BST is an available technology within applied behavior analysis that can be applied as a naturalistic and individualized learning approach for individuals with ASD.

BST involves youth, or adults, receiving instructions describing the behavior and the contexts in which it should occur. After the behavior is modeled within a realistic role play context, they are then provided repeated opportunities to rehearse the target skill while receiving praise and corrective feedback. Given the highly individualized nature of BST, BST lends itself well to teaching youth with ASD to engage in safe behaviors during interactions with LEOs. Due to a primary focus on the replication of single case design procedures, there are few ABA studies that make use of qualitative research to inform BST programs (i.e., Poche, Brouwer, & Swearingen, 1981). Similarly, the opinions of LEOs are often absent from the initial development, or extension, of BST safety skills programs. In hopes to improve partnerships with diverse families, recommendations have emphasized the importance of increasing caregiver input and involvement in autism research (Pearson et al., 2019; Stahmer et al., 2019). Thus, the current project filled an important gap by prioritizing the incorporation of stakeholder (youth with ASD, their caregivers, and LEOs) input to drive the evaluation of locally relevant program content.

Dearth of Evidence-Based Supports

Evidence-based practice in psychology is the integration of the best available research, with clinical expertise in the context of client characteristics, culture, and preferences (APA Presidential Task Force on Evidence-Based Practice, 2006). As previously mentioned, one of the essential requirements for interventions to be considered evidence-based is that they are evaluated on the populations for which they will be intended (APA Task Force on Evidence-Based Practice for Children and Adolescents, 2008). Evans (2010) indicated that it is imperative to find out for whom interventions work and under what conditions. Most law enforcement-youth interventions are tailored for typically developing youth within the community and school setting to build rapport and prevent substance abuse (Anderson, Sabatelli, & Trachtenberg 2007; Curtis 1999; Ringwalt et al. 1994; Schuck, 2013; Smoot, 2016).

Unfortunately, past community policing interventions are not individualized to provide children and adolescents with explicit skills-based strategies for interacting with law enforcement officers in the community. Nation and colleagues (2003) determined that intervention program relevance is a direct function of the degree to which a community's norms, cultural beliefs, and practices have been integrated into program content, delivery, and evaluation. Within the ASD population, the utilization of ASD services is extremely important, but often underutilized by communities of color. However, these subpopulations may be more inclined to engage in services if interventions were perceived to be more relevant and applicable from the perspective of ethnically diverse families (Barrera, Castro, Strycker, & Toobert, 2013; Davenport, Mazurek, Brow, & McCollom, 2018). There is presently a need for continued evaluation

of evidence-based safety prevention, and intervention, programs that meet the local environmental needs, as well as phenotype, of ASD youth populations. To date, the research in the area of ASD and police contact remains cross-sectional in nature.

Overview of Current Law Enforcement Safety Resources for ASD Populations

The BE SAFE curriculum consists of video-based instruction on law enforcement interaction expectations and safety (Teachtown, 2017). The BE SAFE curriculum is designed for disability populations (12 years and older) to watch videos, complete worksheets, and discuss topics related to law enforcement safety knowledge and behaviors. Specifically, it teaches skills necessary to appropriately respond to law enforcement and seeks to increase individuals' safety knowledge about their rights, community integration, and other first responders. Individuals with ASD often receive multiple forms of interventions (i.e., behavioral, social, medical, etc.), including those that have been found ineffective or yet to be evaluated but preferred by caregivers (Lerman et al., 2008; Smith & Antolovich, 2000; Smith, 2015). Interactions with law enforcement have garnered the attention of caregivers of individuals with ASD and professionals. With this increased need, the curriculum BE SAFE has been widely endorsed, or adopted, by popular national organizations like Autism Speaks (Autism Speaks, 2018a; Autism Speaks, 2018b), even though it has yet to undergo the empirical evaluation process.

Floreo Virtual Reality

Floreo has a current clinical trial funded by the National Institute of Mental Health that is investigating the safety and feasibility of a virtual reality-based law enforcement safety module. The clinical trial is currently undergoing evaluation at the

Children's Hospital of Philadelphia (Parish-Morris et al., 2018). The software is an application that provides a 3D environment for headset compatible smartphones and is connected to a tablet or phone to monitor the participants' virtual world. The law enforcement safety model is an immersive story that was designed to show an urban virtual setting in order to engage users in a virtual encounter with a LEO and included strategies (i.e., story based and video modeling strategies). Floreo cohorts included 60 individuals aged 12-60 years (mean age: 16.9; 87 males) with ASD and verbal/overall IQ greater than or equal to 75. Participants attended up to 3 sessions, and during sessions participants engaged in four 2-minute interactions with virtual LEOs. The control condition included 3 sessions that included the BE SAFE curriculum. The clinical trial has only released acceptability results thus far during the International Society of Autism Research Meeting (Zitter et al., 2019).

Summary

ASD is a chronic neurodevelopmental disorder that impacts individuals' ability to communicate and interpret their environment, resulting in challenges with social interactions. Individuals with ASD commonly have difficulties with exhibiting the appropriate social skills throughout their lifespan. As such, a growing number of interventions have been employed to improve specific social communication and interaction skills for individuals across the lifespan. As the prevalence of autism rises, so does the number of adolescents with ASD transitioning into adulthood who will have contact with LEOs. With recent cases emerging in the news related to arduous interactions between individuals with ASD and LEOs, it is important to address the possibility of law enforcement contact. Even in the absence of criminality among ASD

populations, it is important that youth are prepared prior to law enforcement contact in order to prevent future negative occurrences. It has become increasingly common for caregivers of individuals with ASD to seek interventions for social skills training, but available interventions focused on law enforcement interaction have yet to undergo adequate scientific evaluation.

Purpose

The purpose of the current study was to conduct a qualitative and experimental analysis of a culturally informed police safety skills training for adolescents with autism spectrum disorder (ASD). The current study focused primarily on meeting the unique training needs of Black adolescents with autism spectrum disorder (ASD). A single case design was used to evaluate the initial efficacy and acceptability of a culturally responsive training method. Preliminary evidence about the physiological ramifications of police contact were also collected to begin to examine the broader behavioral and psychophysiological nature of youth's experiences. The current experimental design included in-person simulated contexts that youth, and caregivers, endorsed as relevant to their normal lives, which greatly strengthened the ecological validity of the approach.

Research Questions

The present study addressed the following research questions:

- 1) Will police interaction training, video modeling and BST, improve participants' law enforcement safety skills?
- 2) Will police interaction training reduce self-reported distress and physiological arousal?

- 3) Will the police interaction training result in generalization of law enforcement safety skills in a naturalistic context outside of clinic?
- 4) Does the police interaction training result in maintenance of law enforcement safety skills at 1 week, 3 weeks, and/or 7 weeks following the end of the treatment phase?

CHAPTER III: METHODS

The goal of the current study was to assess the following: 1) evaluate the preliminary treatment efficacy of a culturally sensitive law enforcement interaction skills training model with Black adolescents with ASD using a multiple baseline design across participants; 2) determine the treatment impact on secondary outcomes, including self-reported stress and biological/physiological arousal (i.e., cortisol levels and heart rate variability); and 3) examine whether the acquired law enforcement interaction skills and psychophysiological outcome gains are maintained after treatment. This chapter outlines the design, procedures, and analyses used within the study.

Recruitment

Following the securing of campus Institutional Review Board (IRB) approval, participants were recruited from the Midwest. Adolescent and caregiver participants were recruited using the local autism center's database, this granted IRB approved access to over 2,500 individuals with ASD (i.e., including the results of golden standard autism diagnostic instruments and tools; extensive medical and historical information, and facilitated targeted and efficient subject recruitment to diverse adolescents). For the current study, ARC services included access to, and use of, the ARC database, identification of eligible subjects, recruitment consultation, and the golden standard research reliable phenotypic assessment Autism Diagnostic Observation Schedule, Second Edition (ADOS-2; Lord et al., 2012) and IQ testing scores. The ARC database was used as the primary recruitment strategy to ensure past evaluation data, but snowball sampling (i.e., recruited through word-of-mouth and referral of current participant) was also utilized due to research highlighting it as a more effective approach for targeting

African American and other minority subgroups (i.e., Bonevski et al., 2016; Hilton et al., 2010; Sadler et al., 2010).

Caregivers were contacted via email with information related to: a) the study purpose, b) eligibility criteria for participation, c) location and time of the study (in-person and remote), d) duration of initial qualitative focus groups, and e) study contact information (i.e., tailored study email). After participants followed up via email, they were emailed a brief screener that determined if their child met study criterion. After eligibility status was confirmed, caregiver participants were scheduled for one of two parental focus groups that lasted 60-90 minutes. All focus groups and individual interviews were conducted through ZOOM, for those who are far away with internet access, and simultaneously provided in-person within the research building of the autism center. Both of these modalities allowed for sessions to be both dually audio and video recorded. Caregivers were consented in person and given the description of the aims and requirements of both phases of the broader project (i.e., qualitative phase and training evaluation phase). For various reasons, two families withdrew after completing the initial screener and were unable to reschedule. The number of participants for the qualitative phase of the project included 8 adolescents, 14 caregivers (9 mothers and 5 fathers), and 17 law enforcement patrol officers.

Diverse Participant Recruitment and Selection. Deliberate effort was placed towards recruiting adolescents who are diverse in terms of age, gender, race (i.e., Black ancestry), ethnicity (i.e., classifying Afro-Latino vs. African American separately), level of parental education, neighborhood, household income, family structure, and exposure to LEOs Given that autism is a neurodevelopmental disorder that includes individuals with a

diverse presentation in abilities and clinical characteristics, maximum variation sampling provides a more comprehensive picture of factors that contribute to their perceptions and experiences with law enforcement. In order to promote the inclusion of diverse participants, caregivers of adolescents of African ancestry were recruited. More specifically, separate recruitment criterion for caregiver race/ethnicity was used to promote the inclusion of diverse representation, experiences, and family structure (i.e., adoptive caregivers and biracial youth with African ancestry).

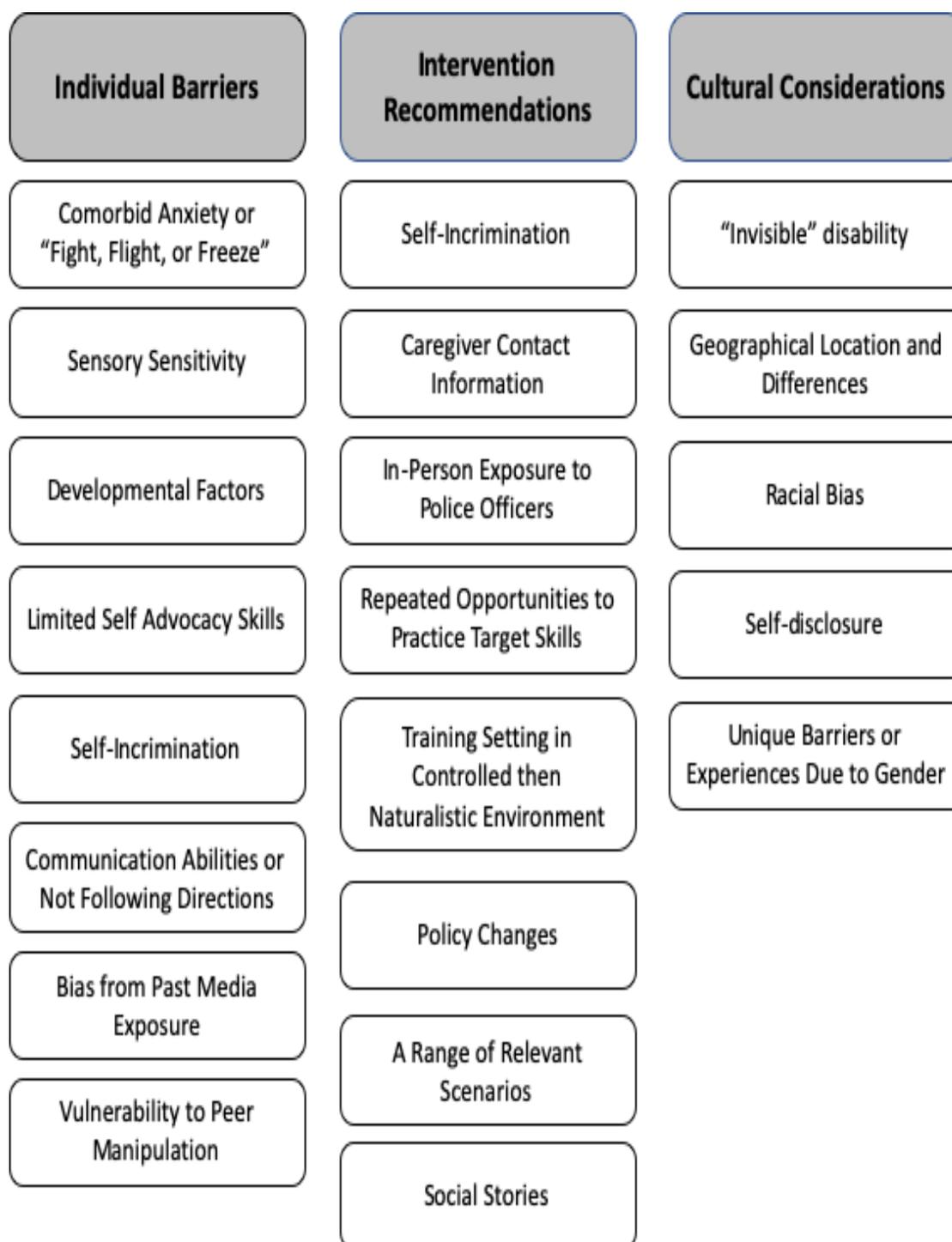
Qualitative Interviews and Focus Groups

Following university Institutional Review Board approval of this study, the qualitative phase was initiated. The first and third author conducted individual semi-structured focus groups and follow-up interviews with participants. All interviews and focus groups were audio recorded and the third author maintained field notes. A grounded theory approach (Charmaz, 2006) was used to guide qualitative methods. Microanalysis was used for all the focus groups to ensure that important ideas or constructs were not overlooked. Questions were added to subsequent individual interviews with adolescents and caregivers to garner the most relevant concepts that would inform the theoretical framework for the development of training methods and content.

The data were analyzed using a multi-step approach. The interview audio recordings were transcribed by the first and second author. The experimenters independently coded transcripts and field notes. During the initial coding process, a comparative method was used to compare statements that were inconsistent with emergent themes. Axial coding was used to reduce the data into smaller subcategories of

themes (Strauss & Corbin, 1998). During final analyses, authors selected a set of themes that represented the unique, and shared, perspectives of families and LEO. This decision-making process was completed to account for the variation in responses that existed across caregivers (i.e., cultural considerations). Furthermore, given that past study samples (Cheely et al., 2012; Rava et al., 2017; Tint et al., 2017; Turcotte et al., 2018) included primarily Caucasian adolescents and adults, the qualitative phase of the larger study outlined preliminary cultural differences that existed between adolescents with ASD from different socioeconomic statuses and ethnic groups (refer to Figure 1).

Figure 1.
Qualitative Research Findings



Participants

Therefore, participants who met criterion for the current study included five adolescents (three Black and two Multiracial). The ethnic identity of participating adolescents was determined by their caregivers, given the explicit aim of this larger project to assert the intersectional identities and experiences of participants. Some participants, or their caregivers, self-identified as being of African ancestry differently (i.e., Afro-Latino). For example, some reported varying definitions in their affiliated Blackness as a result of one biological parent identifying with a non-Black racial/ethnic background, or caregivers having ethnic backgrounds connected to other locations in the African Diaspora (i.e., Jamaica and Puerto Rico). Therefore, the racial categories are referenced, but the descriptors reported by caregivers are detailed further within participant characteristic summaries. The five adolescent participants were also diversely representative relative to verbal abilities, co-occurring diagnoses, age, gender, ethnicity, level of parental education, neighborhood (i.e., suburban, rural, and urban), household income, and family structure. Eligibility criteria included the following: (a) African ancestry, (b) ASD diagnosis, (c) adolescents between the age of 12-18 years old, (d) parental concern related to adolescent's knowledge about, and current skill level during, law enforcement interactions, (e) ability to understand and comply with one-step verbal directions, and (f) residency with caregivers who were willing to participate in focus groups prior to implementation. ASD diagnoses were clinically confirmed through previously conducted clinical evaluations using Autism Diagnostic Observation System, second edition (ADOS-2; Lord et al., 2012). Table 1 shows participant characteristics.

Table 1

Participant Characteristics

Descriptions	Sample
Youth Characteristics (n = 5)	
Age	14.40 (1.67)
Sex	
Male	4 (80%)
Female	1 (20%)
Race	
Black	3 (60%)
Multiracial	2 (40%)
Comorbid Diagnoses	
Attention-deficit hyperactivity disorder	3 (60%)
Generalized Anxiety Disorder	2 (60%)
Oppositional Defiant Disorder	1 (20%)
Obsessive Compulsive Disorder	1 (20%)
Caregiver Demographics (n = 10)	
Race	
Caucasian or White	2 (20%)
Black	6 (60%)
Hispanic or Latino	1 (10%)
Multiracial	1 (10%)
Education Level	
Associate's Degree	2 (20%)
Bachelor's Degree	4 (40%)
Master's Degree	4 (40%)
Neighborhood Context	
Rural	4 (40%)
Suburban	4 (40%)
Urban	2 (20%)
Relationship Status	
Married	8 (80%)
Divorced	0 (00%)
Single	0 (00%)
Partnered	2 (20%)
Relationship to Child	
Biological Mother	4 (40%)
Biological Father	2 (30%)
Adoptive Mother	1 (10%)
Adoptive father	1 (10%)
Stepmother	1 (10%)
Stepfather	1 (10%)
Yearly Income	
30,000-50,000	2 (20%)
50,001-70,000	4 (20%)
70,001-90,000	2 (20%)
Greater than 90,000	2 (20%)

Participant 1

Participant 1 was a Multiracial (African American and White) 17-year-old male with ASD, Attention-Deficit Hyperactivity Disorder (ADHD), Generalized Anxiety Disorder (GAD), and Oppositional Defiant Disorder (ODD). His biological parents were married, and both of his parents had master's degrees. Collectively, his caregivers made greater than \$90,000 a year. Participant 1 resided in an urban Midwestern environment. He had an IQ of 119 and was described as having excellent verbal communication abilities and demonstrated an average ability to receptively understand complex multi-step directions. However, his mother reported that he still had difficulty with "pragmatic" or social language.

Participant 2

Participant 2 was a Jamaican American 13-year-old male diagnosed with ASD. His biological parents never married, but his biological mother and stepmother were married and his primary caregivers. His biological mother had a master's degree and his stepmother had a bachelor's degree. Combined, both made between \$50,000-\$70,000 a year. Participant 2 resided in a suburban Midwestern environment. He had an IQ of 117 and was described as having good verbal abilities and demonstrated an ability to receptively understand multi-step directions.

Participant 3

Participant 3 was an African American 13-year-old female diagnosed with ASD. Her biological parents were married. Her mother had a master's degree and her father had a bachelor's degree. Combined, both made between \$70,000-\$90,000 a year. Participant 3 resided in a suburban Midwestern environment. She was nonverbal and utilized

approximations, gestures, picture boards, and a communication device. However, she had a nonverbal IQ of 109 and an ability to follow verbalized one-step and multi-step instructions. Specifically, she could follow three- to five-step directions with visual and verbal prompting. In addition, her mother reported that in the past she benefited from video modeling for skill acquisition.

Participant 4

J.M. was a Multiracial (African American and White) 14-year-old male diagnosed with ASD, ADHD, and GAD. His adoptive parents were married, and both of his parents had bachelor's degrees. Collectively, his caregivers made between \$50,000-70,000 a year. Participant 4 resided in a rural Midwestern environment. He had an IQ of 91 and was described as having good verbal communication abilities and a strong ability to receptively understand complex multi-step directions. However, his mother reported that he continued to occasionally have expressive speech difficulties that impacted his ability to pronounce his words clearly.

Participant 5

Participant 5 was an Afro-Latino (Puerto Rican and African American) 15-year-old, male with ASD, ADHD, and Obsessive-Compulsive Disorder (OCD). His biological mother and father were never married, and his mother's longtime partner was a primary caregiver who resided in the home. His mother and stepfather had associate degrees and combined both partners made between \$30,000-\$50,000 a year. Participant 5 resided in a rural Midwestern environment. He had an IQ of 87 and was described as having good verbal communication abilities and reportedly demonstrated language use that was completely typical. He displayed strong receptive abilities during initial baseline

assessment that demonstrated a strong propensity to understand abstract concepts and multi-step instructions.

Partnership with Local Law Enforcement

A partnership was established with local law enforcement to recruit experienced community patrol officers to understand local police procedures and community-based resources. Due to the spontaneous nature of their demanding patrolling schedule, law enforcement focus groups were conducted during morning meetings prior to the start of their patrol shifts. This partnership was established with local law enforcement to recruit experienced community patrol to receive live autism training as co-implementers for adolescent's law enforcement interaction training. Due to the demanding LEO patrol schedule, 14 patrolling officers were assigned to varying participant appointments (1 baseline assessment, 2 training sessions, and 3 maintenance assessments) and time of day (morning vs. afternoon) by their sergeants. In addition, each officer had a 45-min meeting with the first author prior to the start of their Saturday shift.

Setting

All assessment and trainings sessions were conducted in a therapy room in a university-based autism center. The experimenter conducted sessions with the assigned patrolling officer in a therapy room (3 m × 3.5 m), which was equipped with a video camera recording system (Milestone Systems), and one-way mirror for caregivers and data collectors to observe the sessions. A table, chairs, and laptop were in the room during video modeling sessions. In this structured and restrictive setting, participants received law enforcement interaction training (i.e., behavioral skills training) with the assigned patrol officer and lead experimenter.

Measures

Police Interaction Skills. Target safety skills were coded using the following 0-3 point scale: 0 = engaged in any problem behavior (i.e., aggression, self-injury, elopement, yelling); 1 = no problem behavior occurred (i.e., aggression, self-jury, elopement, yelling) but they did not remain still nor within appropriate distance (i.e., approximately 3 feet); 2 = remained still within the appropriate distance of the LEO but did not comply with police officer requests; 3 = stood within the appropriate distance, remained still without any physical movement unless requested by LEO, and complied within 5 s with all of the LEO requests.

Salivary Cortisol Concentrations. Salivary cortisol samples were obtained from participants prior to, and following, police interaction (i.e., twice during each session). Participants were instructed to avoid food and drink consumption at least 1 hour before sessions. If they did eat less than 1 hour before sessions, the participants were asked to brush their teeth. Participants passively drooled into a test tube using a straw, with approximately 1 mL of saliva collected for analysis. All samples were then refrigerated until being stored in a -80°C freezer. Enzyme-linked immunoassay (ELISA) was used to analyze the cortisol concentrations present in the saliva samples in accordance with previous investigations in ASD (Ferguson et al., 2016). Change scores were calculated and the unit of measurement was $\mu\text{g/dL}$.

Heart Rate Variability. Brief electrocardiogram (ECG) recordings were collected for eight minutes. Compared to typically developing adolescents and young adults, those with ASD require longer desensitization period (Primeau et al., 2016). Since the BIOPAC system only required two leads, data collected included 3 min for

acclimation and the remaining 5 min for analysis. A BIOPAC MP 150 modular data acquisition and analysis system attached to a laptop computer was used to collect all ECG data (BIOPAC Systems, Inc.). ECG data were collected utilizing a BIOPAC amplifier connected to an extension cable and electrode leads (BIOPAC Systems, Inc.) attached to a data acquisition system. The amplifier was set at a gain of 1000, and a low pass filter of 0.05 Hz. Participants were connected to a 2-lead ECG setup consisting of BIOPAC disposable Ag/AgCl pre-gelled electrodes with a moderate adhesive for contact with the skin. One lead was placed below the right clavicle, in the mid-clavicular line within the frame of the rib cage, and the other on the lower left abdomen within the rib cage frame. Leads were attached using procedures sensitive to the sensory sensitivities associated with ASD. ECG data was acquired using AcqKnowledge Data Acquisition and Analysis Software Version 4.2 (BIOPAC Systems, Inc.). Time domain analysis of short-term HRV was performed using Kubios HRV Standard 3.2.0 software (Tarvainen et al., 2014).

Subjective Units of Distress Survey (SUDS; Self-Report). This measure was used to assess self-perceived stress and their personal reaction to a potential anxiety producing/stressful situation (i.e., police interaction) on a multipoint scale (thermometer using a 0-100 scale). Past studies highlighted that the two SUDS items were strongly correlated, so the “feeling good” item will be reverse scored and averaged with the “stress” item to form a SUDS composite score. Assessors administered the SUDS survey, provided the rating instructions, and oriented participants to thermometer visual rating system one scale at a time (i.e., they were separate thermometers). The Stress item thermometer was scaled so that 0 indicates “no stress at all” and 100 will indicate the

“most stress you have every felt”. The feeling good item thermometer was scaled so that 0 indicates “not feeling good at all” and 100 indicates “the best I have ever felt”.

Procedural Fidelity and Interobserver Agreement

The first author received eight hours of training across two days delivered by the creator and developer of BE SAFE (Be Safe, 2018). The other assisting data collectors were graduate trainees from doctoral level psychology programs. Graduate trainees assisted with collecting fidelity data using a five-item scale to determine whether all components of the behavioral skills training (BST) intervention were implemented with fidelity. All ratings 80% and above will be considered quality BST implementation. Treatment integrity was calculated by dividing the number of correct implementation steps by the number of correct implementation steps plus errors and multiplying by 100. Treatment integrity for all BST sessions was 100%.

A second observer collected data during 33% of all sessions. In each session, an agreement was scored for each of the responses to determine whether observers recorded an occurrence or a nonoccurrence. Agreement was calculated as a percentage of agreement for each session. Procedural fidelity agreement was calculated by dividing the number of correct implementation steps by the number of correct implementation steps plus errors and multiplying by 100. Interobserver agreement (IOA) was 92.5% (range, 87.5% to 100%).

IOA was collected for the four-point scale police interaction skills. Trained observers recorded adolescent responses live during police interaction sessions. Observers were required to achieve at least 80% agreement with each other prior to commencing scoring in data collection sessions. A primary observer scored all data live

and a secondary observer double coded a random sample of 30% of sessions for reliability. A point-by-point procedure was used, and agreements were calculated by dividing the number of agreements by the number of agreements plus disagreements, multiplied by 100. The mean IOA scores across observers for each participants' response ranged from 92 % to 95%.

Social Validity

The Treatment and Acceptability Rating Form-Revised (TARF-R; Reimers & Wacker, 1988) was adapted and used during maintenance (refer to Appendix A). The measure assessed parent perceptions about their child's level of fear, communication, obsessiveness, and cautiousness on a Likert scale (1-5 scale). In addition, the assessment modifications included parental report of observed generalization, overall satisfaction, importance level for police related training, and general comments.

Experimental Design and Procedures

This study employed a concurrent multiple baseline across participants design. The design consisted of three phases: (a) baseline, (b) intervention, and (c) maintenance. All participants underwent a 2-min assessment of their relevant law enforcement safety skills with an assigned LEO. The participant's caregivers were interviewed about scenarios the participants could be exposed to with LEO (e.g., mistaken identity, reported missing after elopement, peer influenced crime, and traffic violations). The scenarios allowed for youth to be exposed to standard policing procedures, which simulated the approach that LEO who were not aware of their disability status might execute. The participants were then taken into the two-way mirrored therapy room and told the preface of the scenario to allow for them to understand the context of the role-play (i.e., "You are

riding in the car with your older sibling and officer ‘blank’ will now come in to practice pulling you over and asking you some questions”). In addition to the assigned LEO, an observer (unseen by the participant) was present to code the child’s responses to the novel police officer. A Motivator Timer was used to discretely signal the completion of timed intervals for data collectors and session completion for participating patrol officers assisting with role plays.

Baseline. During baseline, LEO were asked to engage in interactions with adolescent participants to simulate possible scenarios that youth may encounter in the community. The observers and caregivers were on the other side of the two-sided observation mirror. Each session was scheduled during a weekend timeslot convenient for the families schedule. A minimum of four data points were collected. Following the baseline phase, participants completed a brief knowledge assessment quiz that assessed their understanding of their rights and safety skills related to interacting with police officers.

Intervention. The police safety skills training included two training components: video modeling using the BE SAFE curriculum videos and BST to individually teach adolescents police safety skills.

Video Modeling. BE SAFE is an online curriculum with four video model clips, provided through TeachTown (Be Safe, 2018), which provided the participants with instruction related to police interaction or emergencies. Training included (a) review of law enforcement officers promoting community safety, (b) law enforcement uniforms and safety tools, (c) self-disclosure of disability, and (d) being safe during an emergency. Due to police and caregiver reporting concerns related to the ecological validity of some

videos, the selection of model clips was narrowed from 8 to 4 videos and the concept of presenting an ID card (i.e., may be confused with local Sovereign Citizens Movement) was replaced with jewelry only. Video 1 (*Law Enforcement Officers Help Us Be Safe*) outlined that the job of law enforcement professionals was to help and protect people, keep neighborhoods safe, and make sure everyone follows the law. The clip also highlighted that community members should follow instructions from the police right away. Video 2 (*Uniforms and Safety Tools*) focused on displaying the police as regular members of the community. The video modeled how to have relaxed and friendly interactions with the police while at the same time describing there are limits and boundaries (i.e., not touching police officers nor their uniforms or their safety tools). For example, the video shows a “casual encounter” of a police officer at a local restaurant and models how participants should remember safety rules (i.e., requesting to know more about equipment while refraining from touching). Video 3 (*Self-disclosure*) focused on communicating concisely with the police and self-disclosing a disability. The video modeled an adolescent female using her self-disclosure dialogue and autism bracelet after being pulled over in vehicle by two police officers. Video 4 (*Be Safe in An Emergency*) discussed calling 911 and how to handle medical emergencies. The video modeled a young adult man with a disability completing “on the spot” regurgitation of important home and neighborhood location information after his friend has an epileptic episode. The video also highlighted suggestions for youth who require a visual resource with their detailed information following police arriving to support after they call a dispatch operator using 911. Video modeling sessions were conducted following participants watching all four videos.

Behavioral Skills Training (BST). Participants received verbal instruction on what to do when interacting with a police officer. The lead experimenter instructed participants to remember that it is important to: (a) stay calm, (b) remain where they are, and (c) do what the officer says. Participants were also told not to run from, fight with, or argue with police officer. After delivering the instructions, the experimenter modeled the target responses required to interact safely with the assigned LEO. Specifically, the experimenter modeled how to stay calm without problem behavior or movement unless requested by the officer, remain still within appropriate distance from police officer (i.e., arm distance) with their hands visible, and cooperate with LEO commands.

After the model was provided, each participant rehearsed the appropriate interaction skills with an assigned police officer a minimum of three times, unless further rehearsal was needed. Correct demonstrations resulted in immediate behavior-specific and descriptive praise from the LEO and experimenter. If the response was incorrect, the LEO provided immediate corrective feedback, the experimenter modeled the response, and the participant rehearsed the skill again. The master criterion was demonstrating police interaction skills correctly (i.e., score of 3) for three consecutive sessions. After multiple BST sessions were completed, families interacted with their assigned police officer to debrief and discuss ways they could help their child display appropriate police safety skills in the future.

Maintenance and Generalization. During the maintenance phase, follow-up sessions were conducted with all participants 1, 3, and 7 weeks after the completion of the post-training assessment. Maintenance in-situ assessment probes occurred following the same sequence of procedures described during the baseline phase. Prior to the

beginning of the session, the participant was informed that the training situation would allow for them to understand the context of the in-situ assessment. To truly assess the maintenance of skills, no behavior-specific praise and descriptive feedback was provided from either the assigned LEO or experimenter.

All participants had one generalization session conducted with an actual police officer seven weeks following the intervention. The session occurred in a generalized setting directly outside of the autism center after participants achieved skill mastery. This outside environment allowed for participants to practice getting pulled over (i.e., driving age with a valid driver's license), or approached (i.e., walking on the sidewalk), by the LEO who was in their police vehicle with the lights and siren on. Caregivers, observers, and the experimenter were all present intervene if they display distress or any other related emergency.

Analyses

Visual analysis is a strong method for interpreting the presence and strength of a relationship between the independent variable and dependent variables within single case design studies (Lane & Gast, 2014). Thus, when interpreting the behavioral responses (i.e., police interaction skills), visual analyses included changes in level, trend, and variability or stability of data. Percent of non-overlapping data (PND) was used as an additional supplement visual analysis. To calculate PND, the highest (or lowest) baseline data point is compared to the data points in the intervention phase. The proportion of data points not overlapping between baseline and intervention phases determine the PND percentage. Specifically, PND percentages above 90% indicate an effective intervention, values between 70% and 90% indicate a moderately effective intervention, values

between 50% and 70% indicate a questionable intervention, and interventions with values below 50% indicate ineffective interventions (Scruggs et al., 1987).

The general idea of PND is that higher percentages constitute a larger magnitude of change, but this approach has limitations (i.e., floor and ceiling effects) that require an additional method for assessing effect sizes for data (Rakap, 2015). Therefore, effect size was calculated for each participants' police interaction ratings using Nonoverlap of all pairs (NAP). NAP is calculated by determining the frequency of overlap between the baseline and intervention data points (Parker & Vannest, 2009; Brossart et al., 2014). A nonoverlapping pair will have an intervention phase data point larger than its paired baseline phase data point. NAP equals the number of comparison pairs without overlap divided by the total number of comparisons. An overlap counts as one point, a tie is half a point, and a nonoverlap is zero points. Effects of 0-.65 are considered weak; .66- .92 is a medium effect; .93-1.0 is a strong effect (Parker & Vannest, 2009). PND and NAP effect sizes were calculated using the SingleCaseES package available through RStudio software (Pustejovsky & Swan, 2018).

CHAPTER IV: RESULTS

This chapter outlines the results of the current multiple baseline design study. The current study addressed the following research questions:

- 1) Will police interaction training, video modeling and BST, improve participants' law enforcement safety skills?
- 2) Will police interaction training reduce self-reported distress and physiological arousal?
- 3) Will the police interaction training result in generalization of law enforcement safety skills in a naturalistic context outside of clinic?
- 4) Does the police interaction training result in maintenance of law enforcement safety skills at 1 week, 3 weeks, and/or 7 weeks following the end of the treatment phase?

Police Interaction Skills

Results of each participants' police interaction skills ratings are provided in Figure 2. The mean and standard deviation for baseline and intervention phases were reported for each participant with effect sizes [i.e., Non-overlap of all pairs (NAP); Percent of non-overlapping data (PND)].

Participant 1 had a stable demonstration of police interaction skills (coded 2) during baseline with an immediate increase in the level of data during the video modeling intervention, signifying an immediacy effect. In turn, Participant 1 reached mastery of their police interaction skills and remained at higher levels during the BST intervention. However, this improvement occurred with the exception of a few lower ratings during the 13th, 14th, and 31st sessions of the intervention phase. Overall, the data appeared to be relatively stable from video modeling to BST intervention, which indicated a minimal

intervention effect between the two different interventions (NAP = .58). The PND from baseline to intervention was .90 and a NAP score of .90 both indicate a medium intervention effect. Figure 2 shows the participants' police interaction skills during maintenance and generalization probes. For Participant 1, the level of police interaction skill ratings during maintenance was lower than skills exhibited in baseline.

Participant 2 showed a stable pattern of responding in baseline (coded 0 to 1), though intervention data appeared to be more variable. Video modeling seemed to have an increasing trend, displaying that video modeling was sufficient in supporting their skill acquisition of police interaction skills prior to BST. During BST, Participant 2 had police interaction skills that remained at higher levels with slight variability during the 20th, 24th, and 31st sessions. The PND from baseline to intervention was .76 and a NAP score of .88 both indicate a medium intervention effect. Compared to baseline, Participant 2 remained at a mastery level during maintenance and performed police interaction skills without variability across week 1, week 3, and week 7.

Participant 3 data appeared flat with some slight variability and decreasing trend in ratings during baseline (primarily a rating of 1). Participant 3 had an upward trend during intervention but did not reach mastery of police interaction skills during video modeling. Specifically, their skills remained at the relatively same level of baseline and was variable with an increasing trend during video modeling. It was apparent, for Participant 3, that BST was necessary for them to reach a level of mastery using police interaction skills. Overall, the intervention effect of BST was positive, although data remained variable with an upward trend. The PND from baseline to intervention was .33

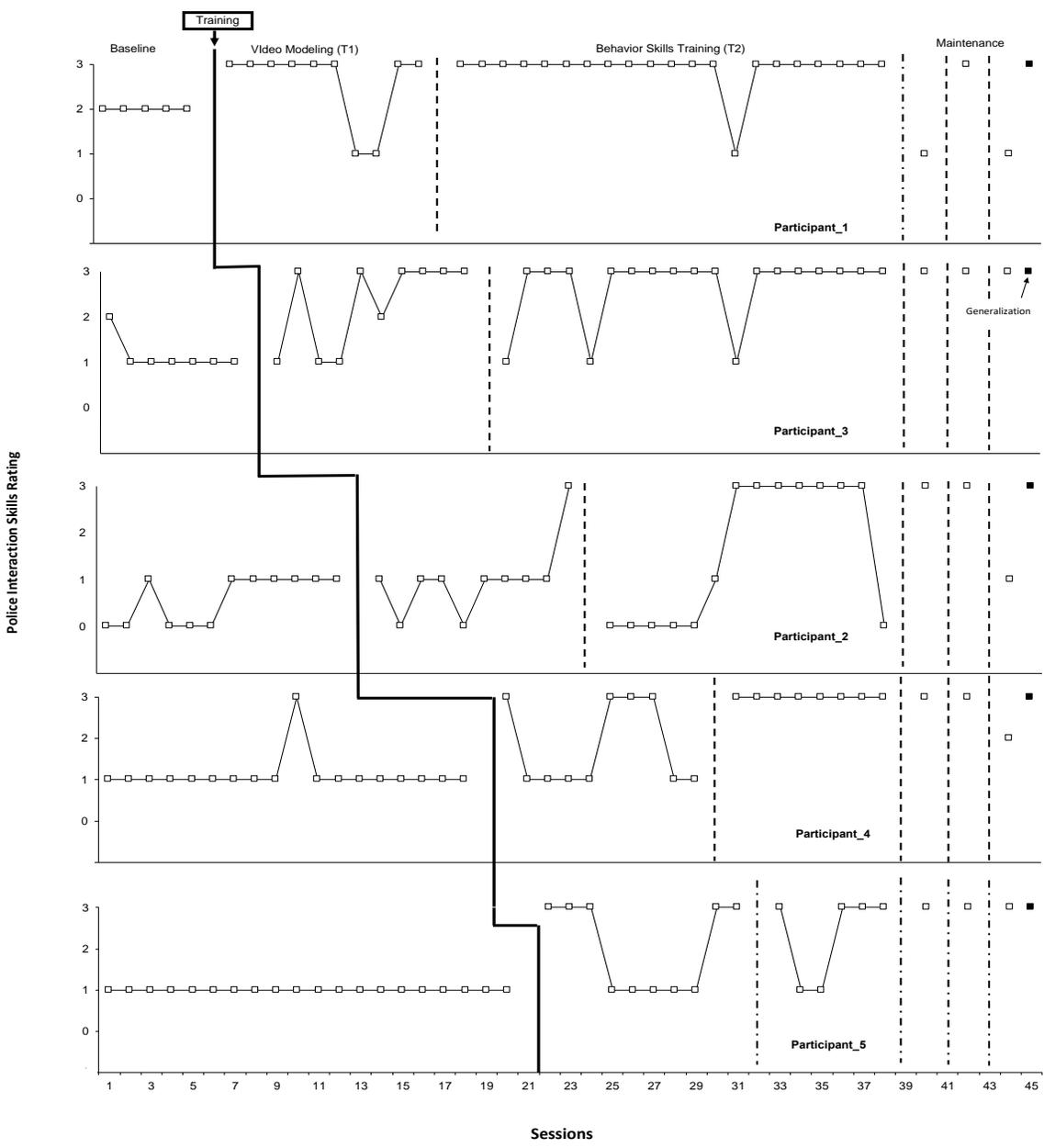
and a NAP score of .64 both indicate a weak intervention effect. Participant 3 remained at a high-level during week 1 and week 3, but week 7 returned to the same level as baseline.

Baseline results for Participant 4 display a steady responding pattern with a spike that occurred once during session 10 (primarily coded 1). During treatment, data remained variable with an increasing trend during video modeling, variability reduced, and mastery was maintained during BST. Specifically, Participant 4 quickly responded to BST displaying an immediacy effect and demonstrating BST was sufficient in increasing police interaction skills to the highest rating level. The PND from baseline to intervention was .00 and a NAP score of .81 both indicate a medium intervention effect. Participant 4 also demonstrated a high level of mastery during week 1 and 3. However, they reduced in level during week 7, but remained above the level of baseline responding.

Participant 5 displayed a stable lower level of police interaction skills during baseline (coded 1). Responding was variable throughout treatment, making it difficult to conclude whether either treatment approach was better than the other. Yet, the level of acquisition in police interaction skills did increase during treatment in comparison to baseline. The PND from baseline to intervention was .56 and a NAP score of .78 both indicate a medium intervention effect. Due to the multiple baseline design, the first intervention component (i.e., video modeling) was initiated at different times for each participant (Rhoda et al., 2011). For example, an observed stable trend during baseline determined if a participant transitioned to treatment, which staggered timing of each participants' receipt of the police training intervention. Compared to baseline, Participants 5 remained at a mastery level during maintenance and performed police interaction skills without variability across week 1, week 3, and week 7.

Figure 2

Multiple Baseline Across Participants of Police Interactions Skills



Exploratory Physiological Arousal and Self-Reported Stress

All participants were able to complete salivary cortisol, HRV, and SUDS self-report assessment during baseline, treatment, and post treatment. Given the generally low number of participants, inferential statistical comparisons across time points were not

conducted. Yet, descriptive analyses revealed valuable trends that are reported in Table 2. Preliminary descriptive statistics revealed that 3 of the participants showed a gradual increase in pNN50 from baseline to post-treatment, indicating an increase in average HRV and therefore a reduction in physiological arousal. Participant 2 demonstrated a higher level of variability overall but displayed a slightly higher level of arousal due to reduced variability during post-treatment. Further, 4 of the participants demonstrated a reduction in peaked salivary cortisol responses, suggesting a reduction in the average stress-related endocrine response from baseline to post-treatment. Lastly, all participants reported lower stress ratings over time. No causal inferences can be determined from the data, but there is an indication that participants experienced lower levels of self-reported stress and physiological arousal. Therefore, additional studies are warranted that examine the mechanisms responsible for reducing arousal and distress in the area of ASD and police interaction.

Table 2

Physiological Arousal and Self-Reported Anxiety

Measure	Participant #	Baseline M (SD)	Treatment M (SD)	Post-Treatment M (SD)	Δ Baseline/ Treatment	Δ Baseline/ Post-Treatment
Cortisol Response	1	1.33 (.32)	1.24 (.07)	.93 (.06)	-.09	-.40
	2	.91 (.11)	.78 (.34)	.77 (.03)	-.13	-.14
	3	1.57 (.59)	1.18 (.31)	1.63 (.01)	-.39	.06
	4	1.60 (.21)	1.41 (.21)	1.46 (.38)	-.20	-.14
	5	1.93 (.08)	1.58 (.30)	1.71 (.08)	-.36	-.23
pNN50 (HRV)	1	1.87 (.63)	2.75 (.56)	6.55 (1.97)	.89	4.68
	2	37.94 (2.54)	39.47 (3.20)	36.92 (12.24)	1.53	-1.02
	3	7.76 (2.96)	4.95 (3.41)	7.54 (2.89)	-2.81	-.22
	4	9.12 (4.56)	14.09 (2.48)	14.91 (5.71)	4.98	5.79
	5	12.34 (1.61)	15.85 (1.94)	23.93 (1.97)	3.51	11.59
Self-Report (SUDS)	1	30 (.00)	40 (14.14)	15 (7.07)	10	-15
	2	25 (21.21)	5 (7.07)	10 (14.14)	-20	-15
	3	50 (42.43)	10 (14.14)	25 (35.36)	-40	-25
	4	67.5 (10.61)	10 (14.14)	5 (7.07)	-57.5	-62.5
	5	55 (21.21)	10 (14.14)	10 (14.14)	-45	-45

Figure 3

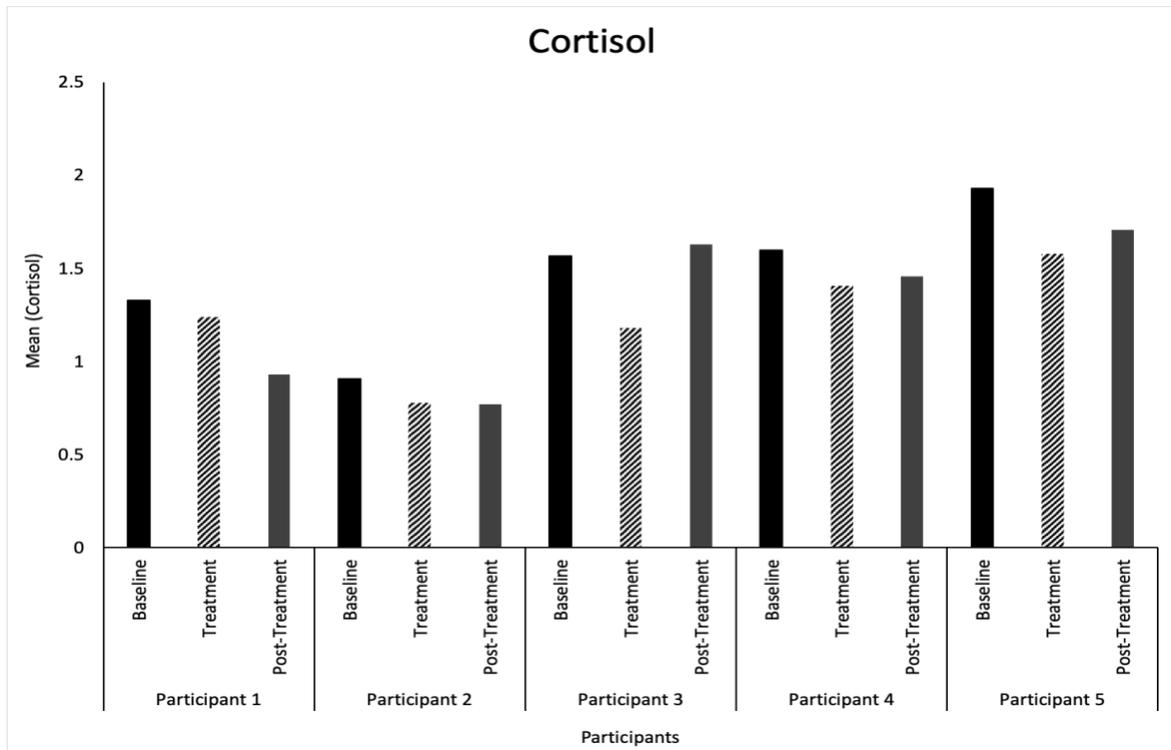
Average Cortisol across Timepoints

Figure 4

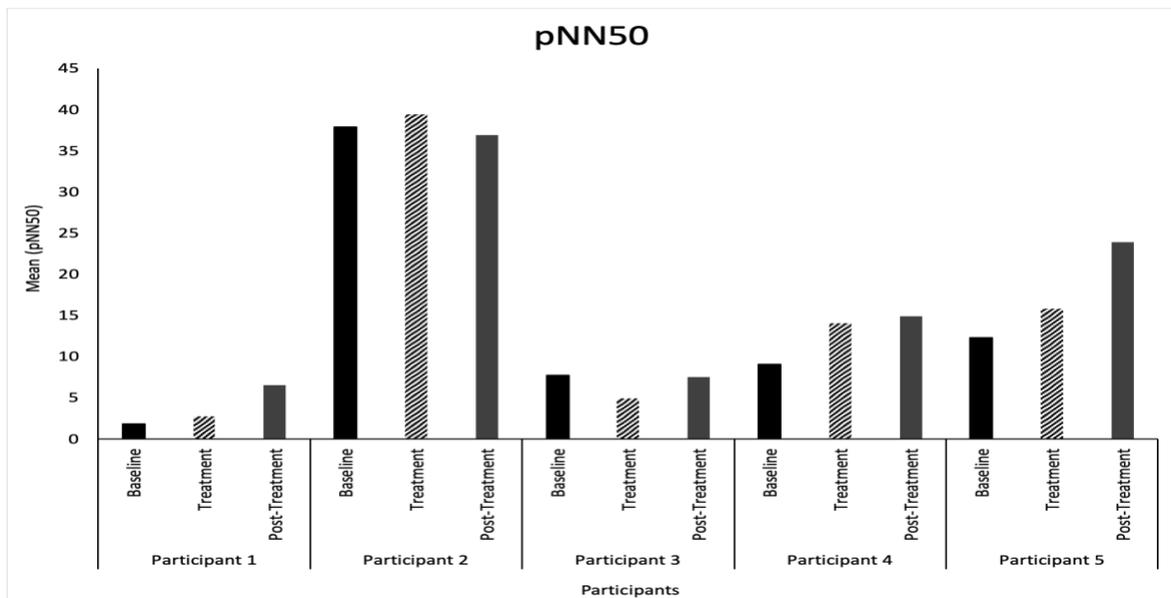
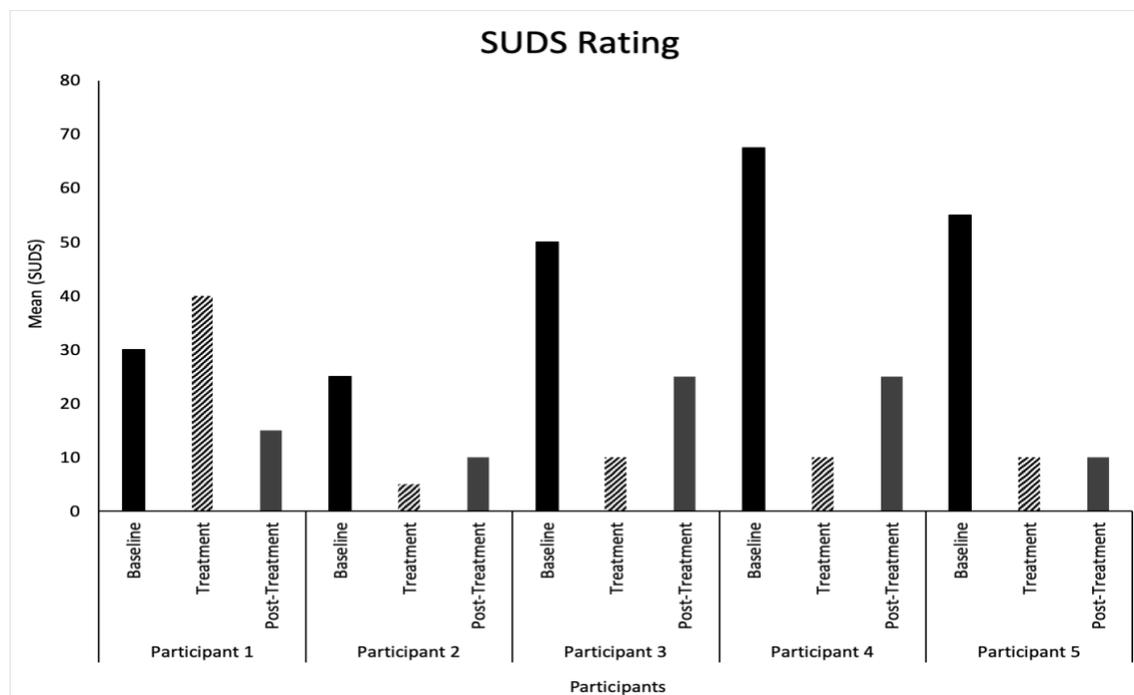
Average Heart Rate Variability across Timepoints

Figure 5

Average Self-Reported Anxiety across Timepoints**Generalization and Maintenance of Police Interaction Skills**

Despite variability during maintenance, all participants appeared to generalize their acquired police interaction skills at a mastery level during the naturalistic generalization probe outside of the autism center.

Side Effects and Social Validity

Relative to side effects, one family reported that they somewhat agreed that their child appeared to be overly communicative about police officers following the police interaction training. All families disagreed that their child appeared to be obsessed with interacting with, or watching videos of, police officers. In addition, all families disagreed that their child appears to be afraid of police officers, or that they appeared more hesitant or cautious compared to before the study. In terms of social validity, 100% of caregivers

agreed their child currently displays appropriate police safety skills. Also, 100% of caregivers reported pleased with their child's participation and satisfied with the researcher's communication throughout the study. Lastly, all caregivers noted the importance of teaching their child to safely interact with police officers in the community.

CHAPTER V: DISCUSSION

The present study expands a growing area of research assessing the nature of police interactions among individuals, particularly adolescents, with ASD. Furthermore, the study joins an emerging direction of this research area that seeks to develop and evaluate intervention approaches that support adolescents and adults with ASD and their safe interactions with LEOs. For example, a recent study (Zitter et al., 2019) examined the initial safety and feasibility of a VR tool used to teach police safety behaviors to adolescents and adults with ASD. Similar to the results of the current study, Zitter and colleagues (2019) found that adolescent and adult participants with ASD had favorable feedback regarding the VR delivered intervention, no serious adverse effects, and acceptable feasibility scores.

Based on preliminary improvements in police interaction skill ratings, evidence of decreased arousal, minimal side effects, uniformly positive feedback from caregivers, and high levels of treatment integrity, it appears that video modeling and BST show promise in addressing the intervention gap related to police interaction in the ASD population. The present study expands a growing area of research assessing the nature of police interactions among individuals, particularly adolescents, with ASD. Furthermore, the study joins an emerging direction of this research area that seeks to develop and evaluate intervention approaches that support adolescents and adults with ASD and their safe interactions with LEOs. Since Black adolescents with ASD and their caregivers are important stakeholders in guiding autism-related research, the process for designing the current pilot intervention promoting safe police interactions took into consideration their important feedback (Davenport et al., 2018). Qualitative feedback obtained from

adolescents and caregivers prior to the implementation of the current study highlighted the importance of a culturally responsive approach, monitoring anxiety or arousal, and using individualized teaching strategies. A primary strength of the present study includes the use of both subjective and objective stress assessments.

Results indicated that the combined police interaction training approach, using video modeling and BST, was effective for all participants. Consistent with prior studies that compared both video modeling and BST (King & Miltenberger, 2017; Morgan & Miltenberger, 2017), video modeling was not an effective training method for three of the participants, and two required BST to reach mastery. Similar to (Godish et al., 2017), video modeling was a useful teaching method for two participants that had higher cognitive abilities. Future research should continue to evaluate whether individuals with higher cognitive and verbal abilities benefit more from video modeling than those with lower abilities. The current study did show that it was possible for nonverbal adolescents with ASD to master police interaction skills using BST. However, future studies should also monitor the level, and types, of prompting or incentives that may be necessary to improve the effectiveness of police interaction focused BST for adolescents and young adults that are nonverbal. Since this study was co-implemented by the research and LEOs, future studies should also evaluate the effectiveness of parent-mediated police-interaction BST with, and without, the support of LEOs (Harriage et al., 2016).

Descriptive statistics revealed a reduction in physiological arousal from baseline to post-treatment. Despite varying improvement in physiological arousal and stress biomarkers, all participants self-reported lower stress ratings over time. These preliminary findings highlight the need for larger studies to assess whether future

treatments can modulate the cortisol and heart rate responses of adolescents with ASD (Corbett et al., 2019). Integrating Gross and Thomson's (2007) modal model of emotional regulation, future police interaction training studies should assess if integrated coping strategies (i.e., cognitive re-appraisal and relaxation strategies) can facilitate habituation among adolescents with ASD (Manigault et al., 2019). Future studies should also assess whether specific mechanisms, like sensory sensitivity, influence physiological arousal before, during, and after police interactions (Goldsmith & Kelly, 2018). Given the self-reported anxiety/distress level and apparent physiological arousal were inconsistent within the current study, it is necessary to explore the correlation between both outcomes in larger future clinical trials (Hufnagel et al., 2017; Spratt et al., 2012).

Police contact disparities are a present problem impacting the Black community (McLeod et al., 2020). Yet, this is the first investigation to target recruitment efforts and acknowledge the intersectional disadvantages that Black adolescents with ASD may face coming in contact with LEOs (Burlew et al., 2019). The current study sought to empower Black caregivers of adolescents with ASD by partnering with them to develop a culturally responsive police training model (Chu & Leino, 2017). During the current project, caregivers reported that the study strengthened their personal knowledge and partnership with local law enforcement. It is recommended that future studies examine strategies for building trust between law enforcement agencies and families that have children with ASD, particularly Black families (Jamison et al., 2017). As future evaluations expand the evidence-base, community agencies should disseminate alternative mental health crisis responder information to Black families of adolescents and adults with ASD that are socially and/or economically disadvantaged. Additional

mixed methods investigations are warranted to ensure the aforementioned culturally responsive resources are socially valid and feasible across a variety of Black communities and geographical contexts (Longtin & Principe, 2016).

Implications for Practice

Currently, ASD focused interventions do not address, nor prevent, factors that significantly interfere with safe and non-incriminating police interactions among adolescents with ASD, and particularly those who are intersectionally marginalized (i.e., discrimination, microaggressions, police racial biases, etc.). Video modeling often includes social skills, scenarios, or other behavioral strategies that could be modified to appropriately address the individualized needs of ASD populations. The current study highlighted the importance of practitioners establishing in-person police interaction training opportunities that have been inaccessible and/or limited for ASD populations through local police departments. In terms of clinical collaboratives between autism centers and their local law enforcement, web-based resources or community-based strategies are still needed to reduce barriers to police-related training or consultative services for underserved and disadvantaged populations. Particularly for vulnerable populations, integrating and evaluating the additive effectiveness of modules, resources, or tailored strategies to aid cognitive and behavioral coping with interpersonal relations with LEOs and systemic racism (i.e., racial/ethnic discrimination or vicarious exposure to police use of force) would inform clinicians understanding of how to address worries and/or physiological arousal among marginalized groups (Metzger et al., 2020).

This observations during the current study revealed additional pathways for future training that would be beneficial to integrate into clinical practice. Specifically, clinicians

may collaborate with local law enforcement to understand the parameters for self-incrimination, disclosing too much information during police encounters, and helping youth to invoke their right of remaining silent until their parent is present before they answer questions beyond basic information (i.e., name, age, caregiver contact info). Although not a target skill within the current study, participants displayed variation in this skill and behavioral therapists may be able to feasibly and safely integrate either of these skills into social skills programming in schools or clinics. Given this study's primary focus on Black adolescents with ASD, generalizability is limited but a brief training model was established that incorporates caregiver feedback (i.e., pre-arranged scenarios). Future mechanistic research and clinical evaluations of police interaction interventions, particularly using either video modeling or BST, are warranted. Past cross-sectional studies, and the present study, highlight the importance of bidirectional interventions tailored to prevent police contact and/or use of force (Cheely et al., 2012; Rava et al., 2017; Tint et al., 2017; Turcotte et al., 2018).

Limitations

To the knowledge of the author, this is the first study to examine the initial efficacy of a culturally sensitive police interaction skills training model on police interaction skills. However, a few limitations should be noted. For instance, conclusions about interventions were different for each participant. Specifically, Participants 1 and 2 demonstrated that video modeling was sufficient for their acquisition of police interactions skills. However, it would have been beneficial to systematically test maintenance following video modeling, then introduce the second intervention (i.e., BST), and then further assess maintenance following BST. In addition, the current study

tested both components as sequentially as a combined intervention, but a formal component analysis might be warranted. Further, Participants 3 and 4 displayed that that BST was necessary to support skill acquisition. Relative to Participant 3, the last data point during video modeling was originally deemed stable at a rating of 1, yet further inspection of the session, and deliberation among raters, led to the increasing rating of 3. This discussion, about the rater discrepancy, occurred after the participant had transitioned to the BST intervention phase of the study. As for Participant 5, their performance of police safety skills during both interventions made it difficult to determine which intervention was better.

Future Research

More rigorous evaluation is needed to address study limitations, including the small sample size, lack of control group, lack of randomization, limited generalization to broader population, and short training period (i.e., 1 weekly session for 3 weeks) and follow-up. Future research should use a randomized controlled design and an active control group to evaluate the culturally sensitive and behavioral training approaches used during this study; assess additional factors (i.e., sensory sensitivity, cultural experiences, or developmental factors), including other biomechanistic outcomes (i.e., alpha amylase); and recruit a larger sample in more diverse regions. These considerations will increase the significance and impact of this work, potentially unearthing the biopsychosocial mechanisms underlying the factors influencing, and resulting from, the police interaction outcomes among adolescents with ASD.

As efforts increase to reduce and eliminate the impact of racism on youth, racial socialization by parents is an approach that advances the mental health and wellness of

Black children (Metzger et al., 2020). Although some believe it is noble to avoid directly discussing race and racism, children develop ideas about race at a young age, whether adults or not adults in their life introduce the topic (Hagerman, 2019). Saleem, Anderson, & Williams (2020) highlight the importance of explicitly, and effectively, talking to children and adolescents about race, particularly given Black families' direct and vicarious experiences. The Racial Encounter Coping and Socialization Theory (RECAST; Anderson & Stevenson, 2019) has been found to be an effective model for helping youth challenge racial stressors, and buffer race-based traumatic stress, positing the effective use of a racial literacy approach, supportive dyadic coping, and cognitive-behavioral strategies within clinical practice (reappraisal of, and coping with, racial stress).

A new model of trauma-focused cognitive behavioral therapy was proposed to address racial trauma by integrating racial socialization process into trauma informed care components (Metzger et al., 2020). The aforementioned theoretical approaches were developed considering that the most efficacious intervention approaches for Black youth include cognitive behavioral therapy and family systems model (individually and combined; Pina et al., 2019). Given the variability in ASD related symptoms and functioning, developmentally, adapting this model for ASD populations may be beneficial among a subset of Black families preparing their children for discriminatory encounters with law enforcement. The field continues to produce specialized autism research that moves towards preventative safety skills practices, and the inclusion of programming promoting safe interactions with LEOs is an important gap to fill.

Conclusion

The fields of special education, applied behavioral analysis, and psychology continue to produce specialized autism research that moves towards preventative safety skills practices, and the inclusion of safe interactions with LEOs is an important step. The current study emphasizes the necessity of collaborating with important stakeholders (i.e., caregivers and law enforcement) and integrating feedback to inform culturally responsive practices. Although the improvements were not notable for all five participants in the current study, the data indicated that the interventions were helpful in improving skill acquisition, reducing physiological arousal, and lowering self-reported anxiety. For generalization and maintenance, future investigations may require increased intervention length to help adolescents reach mastery and demonstrate fluency. This study was high in acceptability and is an important contribution to future research exploring this important area.

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Zitter, A., R. Solorzano², S. Turnacioglu², J. S. Miller³, V. Ravindran⁴, J. Parish-Morris¹ and J. McCleery⁵. Feasibility and safety of immersive virtual reality as a tool to improve police safety in adolescents and adults with autism spectrum disorder. Presented at: International Society of Autism Research 2019 Annual Meeting; May 1-4, 2019; Montreal, Canada.

Appendix A: Side Effects and Social Validity Questionnaire

1. Compared to before this study, my child now appears to be overly communicative about police officers.
2. Compared to before this study, my child now appears to be obsessed with interacting, or watching videos, with police officers.
3. Compared to before this study, my child now appears to be scared of police officers.
4. Compared to before this study, my child appears hesitant, or cautious, when they interact with police officers.
5. Other changes noted in my child's behavior (please described or mark N/A if no changes were observed):
6. My child now stays calm, stands still, and cooperates when in the presence of, or interacting with, police officers in the community outside of training while study was being calculated or after the completion of the study.
7. How pleased are you that your child participated in this study?
8. How satisfied are you with the way researchers communicated what was going on throughout the study?
9. How important do you think it is to teach your child to safety interact when they see or interact with police officers in the community?

VITA

Mattina Davenport earned her Bachelor of Arts degree in Psychology and a minor in Political Science from Clark Atlanta University. She earned her Master of Arts degree in School Psychology from the University of Missouri in May 2017. While at the University of Missouri, Mattina worked as a graduate research assistant on federally funded grant projects for her entire training experience. She provided psychological services within school, clinic, and medical settings. Mattina's research has been published in top tier autism and sleep journals. She has presented at the American Psychological Association Annual Conventions, Association for Behavior Analysis International Annual Convention, and National Council on Family Relations Annual Conference. For the 2020-2021 school year, Mattina will complete her APPIC internship with the Children's Hospital of Philadelphia, an APA approved pre-doctoral internship located in Philadelphia, Pa. Mattina will earn her Doctor in Philosophy in School Psychology from the University of Missouri in July 2021. Her dissertation was the second phase of broader project funded by the Organization of Autism Research.