How Trauma May Magnify Risk of Involuntary and False Confessions Among Adolescents

Hayley M. D. Cleary
Associate Professor of Criminal Justice and Public Policy
Wilder School of Government and Public Affairs
Virginia Commonwealth University
U.S.A

Lucy A. Guarnera
Assistant Professor of Psychiatry and Neurobehavioral Sciences
Institute of Law, Psychiatry, and Public Policy
University of Virginia School of Medicine
U.S.A

Jeffrey Aaron
Juvenile Justice & Behavioral Health Program Manager
Virginia Department of Behavioral Health and Developmental Services
Assistant Professor, University of Virginia School of Medicine
U.S.A

Megan Crane
Co-Director, Roderick & Solange MacArthur Justice Center, Missouri Office
Director, Wrongful Conviction Project
U.S.A

Empirical research on police interrogation has identified both personal and situational factors that increase criminal suspects' vulnerability to involuntary, unreliable, or false confessions. Although trauma exposure is a widely documented phenomenon known to affect adolescents' perceptions, judgments, and behaviors in a wide array of contexts (especially stressful contexts), trauma history remains largely unexamined by interrogation researchers and virtually ignored by the courts when analyzing a confession. This article argues that trauma may operate as an additional personal risk factor for involuntary and false confessions among adolescents by generating both additive and interactive effects beyond youths' general, developmentally driven vulnerabilities in police interrogations. First, we briefly review adolescent trauma symptomatology, emphasizing the heterogeneity of adolescents' responses to trauma. Next, using Leo and Drizin's (2010) "Three Errors" framework of police-induced false confessions, we systematically apply clinical findings to each of the three police errors—misclassification, coercion, and contamination—to outline the psychological mechanisms through which adolescents with trauma histories may be at increased risk for making involuntary or unreliable statements to police. Finally, we offer considerations for interrogation research, clinical forensic practice, police practices, and courtroom procedures that could deepen our understanding of

trauma's role in the interrogation room, improve the integrity of investigative and adjudicatory processes, and ultimately promote justice for adolescent suspects with trauma exposure.

I Introduction

Trauma exposure and posttraumatic symptomatology are tragically common among youth involved in the U.S. juvenile justice system. Surveys of justice-involved youth demonstrate that more than 90% are exposed to at least one traumatic event[1] in their life and that exposure to multiple lifetime traumas is the norm (Abram et al., 2013; Dierkhising et al., 2013). About two-thirds of justice-involved youth report early trauma exposure (within the first five years of their lives), with about one-third reporting exposure to multiple, varied types of trauma each year into adolescence (Dierkhising et al., 2013). While justice-involved youth report exposure to many different types of traumas, exposure to violence is particularly common among these youth as compared to community samples (Abram et al., 2013; Dierkhising et al., 2013). For example, in a sample of 100 justice-involved girls, 70 had witnessed a violent crime, 51 had witnessed domestic violence, 50 had experienced sexual abuse, 49 had experienced physical abuse, and 32 had been the victim of a violent crime (Dixon et al., 2005). The likelihood of trauma-related disorders such as posttraumatic stress disorder (PTSD) increases with repeated trauma exposure, and interpersonal traumas such as violent victimization have the highest contingent risk of PTSD (Kilpatrick et al., 2003). Thus, it is unsurprising that justice-involved youth demonstrate elevated

[1] While "traumatic event" has been defined differently at different times and by different groups, the current definition according to the DSM-5 limits trauma to "exposure to actual or threatened death, serious injury, or sexual violence." This exposure can include directly experiencing the event, witnessing the event, learning about the event occurring to a close family member or close friend, or experiencing repeated or extreme exposure to aversive details of traumatic events. See Dalenberg et al. (2017) for more information on defining trauma.

rates of trauma symptomatology. While estimates vary based on population and methodology, most research indicates that about 10% to 50% of justice-involved youth meet criteria for current or recent PTSD, with PTSD rates higher among females than males (Abrantes et al., 2005; Abram et al., 2013; Cauffman et al., 1998; Dierkhising et al., 2013; Dixon et al., 2005; Wood et al., 2002). This is compared to a 3-6% prevalence rate of current or recent PTSD in community samples of youth (Kilpatrick et al., 2003).

Given near-universal trauma exposure and elevated PTSD rates among justice-involved youth, the juvenile justice system has become increasingly aware that understanding trauma history and symptomatology is critical to understanding system-involved youths' behaviors, and that failing to do so can lead to potentially catastrophic missteps. Trauma-informed approaches now represent expected or emerging practice standards in the juvenile justice system (Jennings, 2008) and related domains such as juvenile courts (Stoffel et al., 2019), legal representation (American Bar Association, 2018), and pediatric medicine (Marsac et al., 2016). Trauma exposure is recognized not only as a cause of mental health problems but also as an influence on physical health outcomes (Holman et al., 2016), likelihood of victimization (Whitfield et al., 2003), and behavior generally (Felitti et al., 1998). Further, neuroscience research continues to reveal the impact of trauma on brain development and functioning (DeBellis & Zisk, 2014).

At the same time, the problem of coerced, unreliable, and false[2] confessions has pervaded both the scholarly literature and the national consciousness. Survey research conducted in Europe indicates that up to 14% of interrogated youth report making a false confession and that the risk of false confession increases the more often the youth has been interrogated by police (Gudjonsson et al., 2009b). Multiplying this figure by the approximately 700,000 juveniles arrested annually in the U.S. (Puzzanchera, 2021) illustrates the potential scope of the problem. Further, interrogation research has explicated both dispositional and situational factors that heighten criminal suspects' vulnerability to police coercion; in particular, adolescents as a class are more vulnerable to coerced and false confessions due to their developmental immaturity (Kassin et al., 2010; Owen-Kostelnik et al., 2006). Despite this well-supported and widely agreed-upon scientific finding (Kassin et al., 2018), American police continue to use interrogation tactics designed for adults with adolescent suspects (Cleary & Warner, 2016). Moreover, laypeople tend to view adolescence as a comparatively weak contributing factor to false confessions and underestimate the reliability of the scientific evidence in this area (Alceste et al., 2020; Mindthoff et al., 2018). Thus, the scientific realities of juvenile false confessions have yet to fully permeate real-world interrogation practice or the broader public consciousness, which partially explains stagnant policies in this area and poses serious implications for adolescents facing criminal adjudication.

Some correlational research suggests that these two seemingly disparate issues of widespread trauma exposure among justice-involved youth and false or involuntary juvenile

[2] Numerous conceptually overlapping terms appear in the literature. This article uses the term *coerced* or *involuntary* confession to mean incriminating statements made in response to external pressures instead of a suspect's own free will. We refer to *false* confessions as a suspect confessing to a crime they did not actually commit, which may happen for a variety of reasons (Kassin, 2008). We use the term *unreliable* confession to mean a confession that may contain erroneous details and is not completely accurate or trustworthy.

confessions may in fact be related. To date, studies by two research groups have begun to investigate a potential association between (a) trauma exposure or its correlates and (b) false or coerced confessions or related constructs, such as interrogative suggestibility and compliance. First, Gudjonsson and colleagues have repeatedly found associations between self-reported negative life events and self-reported false confessions among large community samples of European (primarily Icelandic) adolescents. For example, Gudjonsson et al. (2009a) found that a history of sexual abuse, witnessing violence, and death of a parent or sibling was associated with self-reported false confession, as did (2009b) self-reported history of having been attacked and bullied (boys and girls) and sexually abused (boys only). Second, Drake and colleagues (e.g., 2008, 2015) have repeatedly found associations between negative life events and interrogative suggestibility (as measured in the laboratory by the Gudjonsson Suggestibility Scales) among community samples of British adults. These parallel lines of research suggest a connection between trauma exposure and negative interrogation outcomes, but the correlational findings are presently unable to shed light on causality or potential causal mechanisms.

II Purpose and Scope of the Present Article

This article argues that trauma history is a poorly understood, yet critically important, risk factor for involuntary and false confessions among adolescents that can generate additive and interactive effects beyond youths' general, developmentally driven vulnerabilities in police interrogations (Cleary, 2017). The article builds on foundational research examining very different aspects of this problem. For example, we know that adolescents are overrepresented in documented cases of false confessions (Drizin & Leo, 2004). We know that youths' psychosocial immaturity impairs their perceptions and decision-making during interrogations (Grisso et al., 2003). We know that childhood trauma is extremely common among the justice-involved youth population (Abram et al., 2013). We know a correlation exists between trauma exposure and self-reported false confessions in youth (Gudjonsson et al., 2009a). Finally, we know that trauma exposure can influence individuals' self-regulatory skills, social judgment and interactions, and information processing abilities (MacDonald et al., 2011)—skills that are essential to navigating a stressful interrogation interaction (Davis & Leo, 2012). Our goal in this article is to integrate these existing disparate findings from clinical psychology, developmental neuroscience, interrogation science, and legal practice to propose specific psychological mechanisms by which trauma responses—on their own and via interaction with other developmental vulnerabilities—may increase youths' susceptibility to coercion, decrease the reliability of statements made during a high-pressure interrogation, and ultimately increase the risk of both involuntary and false confessions. As Madon et al. (2012) observed, there is abundant scholarship on interrogation practices, but "theoretical understanding of the underlying psychological processes that operate during police interrogation has not progressed at the same rate" (p. 13). A deeper understanding of the role of trauma symptomatology in the juvenile interrogation room could expand interrogation research, inform police practice, and support legal professionals who litigate juvenile confessions in the courtroom.

Before proceeding further, we pause here to define the scope of this article. Our goal is to expand on existing correlational findings by proposing specific causal mechanisms by which trauma symptomatology might manifest in the interrogation room and heighten the risk of an involuntary or false confession from an adolescent. Although the ideas presented in this paper are

grounded in the broader research literature, the mechanisms we propose are currently untested in the context of juvenile interrogations. Second, although false confessions and subsequent wrongful convictions are an undeniable legal system failure, we do not confine our discussion to the singular outcome of false confessions; we consider broadly the ways in which trauma responses can generally decrease the voluntariness of youths' statements in the interrogation room. U.S. courts require that confessions be given freely and voluntarily in order to be admissible in court (*Brown v. Mississippi*, 1936). Thus, even youths' true confessions are concerning if they are a product of coercion. While not all interrogations are coercive, American approaches to interrogation typically involve confrontation and manipulation (Cleary & Warner, 2016; Kassin et al., 2010) which have clear implications for voluntariness of youth suspects' statements. In addition, we consider trauma's impact on the reliability of youths' confessions, in recognition that unreliable confessions have limited or no evidentiary value, even if a court does not conclude they are false. Finally, we limit our discussion to trauma responses among *adolescent* suspects subjected to police interrogation. Though we acknowledge that trauma symptomatology is relevant to adult suspects as well, trauma can exacerbate developmentally driven vulnerabilities in unique ways (Fairbank et al., 2014). In short, adolescents are already among the most vulnerable populations to face police interrogation, and trauma effects may weaken those defenses even further. In the next section, we provide a brief clinical overview of trauma symptomatology in adolescents as a foundation for this discussion.

III An Overview of Adolescent Trauma Responses

Adolescent responses to trauma vary greatly and can range from the absence of mental health symptoms and even personal growth to overwhelming distress and incapacitation (Levine et al., 2008). When psychological symptoms are present, they may take many forms, including seemingly contradictory ones (e.g., emotional numbing versus emotional reactivity). Thus, to describe the "trauma response" is to acknowledge a broad array of possible behavioral, cognitive, emotional, and physiological reactions. Given this diversity, the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM–5; American Psychiatric Association, 2013) formulation of PTSD is a useful conceptual starting place, as its four symptom clusters describe common responses to traumatic stressors in many cultures and across many trauma types, even among adolescents who do not manifest diagnosable PTSD (Copeland et al., 2007; Hinton & Lewis-Fernández, 2011). Those symptom clusters include (a) intrusions, (b) avoidance, (c) negative alterations in cognition and mood, and (d) alterations in arousal or reactivity.

A posttraumatic response commonly includes fluctuation between re-experiencing the event (intrusions) and efforts to distance oneself from the event (avoidance). An adolescent with trauma exposure may experience intrusive memories of the traumatic event, psychological distress, and physiological activation (e.g., heart palpitations, sweating, dizziness) when remembering or encountering reminders of the event. Thus, the adolescent may strive to forestall this distress by avoiding memories or external reminders of the trauma (i.e., people, places, objects, smells). In a relatively adaptive response to trauma, these disparate reactions resolve with time as the individual recovers (Cook et al., 2005). However, in persons with maladaptive trauma responses, that resolution does not occur and posttraumatic symptoms—which can include intense, dramatic expressions such as nightmares or flashbacks—may persist for years (Kessler et al., 1995).

Negative alterations in cognition and mood, the next symptom cluster, include significantly distorted perceptions, heightened distress, and negative emotional states that may be difficult for others to understand. For example, an adolescent may come to think others are untrustworthy, believe they are responsible for the traumatic event, and maintain that their future is hopeless – reactions that may seem logical but can lead to significant distress and functional impairment when severe and long-lasting. Shame can be particularly debilitating for adolescents given their preoccupation with others' perceptions of them (Habib & Labruna, 2011).

The final symptom cluster involves alterations in arousal or reactivity. Because affected adolescents have encountered horrifying or life-threatening situations in the past, they may experience a persistent perception of heightened threat (Hayes et al., 2012). Overactive physiological reactivity to threat can result in generalized symptoms such as poor sleep, irritability, or difficulty concentrating. Other symptoms (e.g., hypervigilance, recklessness) are particularly common during an emotionally activating circumstance – perhaps an interrogation – in which the adolescent perceives an acute threat. In adolescents, this symptom cluster may present as inattention and hyperactivity that impairs cognitive abilities and decreases capacity to attend to and effectively process information (Habib & Labruna, 2011).

In general, many youth experience these kinds of symptoms in the immediate aftermath (days or weeks) after a traumatic stressor – a response known as an acute stress reaction – while only a minority go on to experience a prolonged, impairing mental health reaction like PTSD (Copeland et al., 2007). Different types of traumatic events carry different conditional risks of trauma-related psychiatric problems (Luthra et al., 2009), but as one example, Zatzick et al. (2006) found that 42% of a sample of adolescents hospitalized with a traumatic injury screened positive for PTSD during the baseline interview (an average of about 12 days post-injury), while only 19% screened positive for PTSD at the 12-month follow-up. Nonetheless, even for the majority of youth who do not develop PTSD and for whom trauma responses abate to some degree over time, the effects of trauma exposure may linger and impact functioning even in the absence of a full-blown clinical syndrome (Cook et al., 2005; Giaconia et al., 1995).

In some cases, the crime being investigated may qualify as a traumatic event for the juvenile, meaning the youth may be particularly likely to experience posttraumatic symptoms during an interrogation conducted just hours to days after the event (Bryant et al., 2011). For example, 14-year-old Michael Crowe was interrogated as suspect shortly after his younger sister had been found stabbed to death in their home (Drizin & Colgan, 2004). In other cases, youth experiencing ongoing abuse or exposure to domestic violence (for example) may have very recently been exposed to a traumatic event prior to an interrogation, prompting an acute stress reaction. However, as PTSD or other severe trauma reactions among adolescents frequently persist for years following the event (Walsh et al., 2012), even youth for whom the traumatic event(s) in question are more distal may still be experiencing posttraumatic symptoms at the time of an interrogation. Finally, the interrogation experience itself may be traumatic and trigger PTSD symptoms. For example, one study found that youth who were stopped by police more frequently were more likely to report posttraumatic stress symptoms (Jackson et al., 2019).

While we argue that the PTSD symptom clusters offer a useful framework for evaluating trauma in the interrogation context, we underscore here that we are not limiting our application of

trauma impact to only those adolescents formally diagnosed with PTSD, for multiple reasons. First, many youth in the juvenile justice who would meet criteria for a trauma-related psychiatric disorder have never been properly assessed and diagnosed. Second, subsyndromal PTSD – that is, posttraumatic symptomatology that falls below the threshold required for a PTSD diagnosis – is still associated with significant impairment (Giaconia et al., 1995). Third, many adolescents with trauma exposure experience functional impairments not captured by a diagnostic category, including behavioral and affective dysregulation, school problems, somatic complaints, identity problems, and disruptions of important relationships (Cook et al., 2005). Finally, most PTSD research has been conducted with North American and European populations, and while there is considerable overlap in symptomatology across cultures (Hinton & Lewis-Fernández, 2011), research with global populations reveals different symptom patterns and idioms of distress (e.g., predominance of depression, somatic complaints, and anxious distress; Michalopoulos et al., 2020; Rasmussen et al., 2014). Thus, limiting discussions of posttraumatic reactions solely to adolescents with formal PTSD diagnoses is likely to exclude many adolescents, particularly the immigrant youth who comprise a growing subset of the system-involved youth population (Abram, 2013).

In sum, youth with posttraumatic reactions do not check their symptomology at the interrogation room door; these diverse cognitive, physiological, and behavioral responses to trauma are likely to follow many adolescent suspects into the interrogation room. In the following sections, we employ Leo and Drizin's (2010) "Three Errors" framework of police-induced false confessions to illustrate how adolescent trauma can manifest at each stage of the interrogation process and could exacerbate the likelihood of an involuntary or false confession.

IV The "Three Errors" as a Framework for Adolescents' Trauma-Related Vulnerabilities in Police Interrogations

Leo and Drizin (2010) offer a framework for understanding the processes by which police-induced false confessions occur. They outline "three sequential errors that occur in the social production of every false confession" (p. 13): (a) the *misclassification error*, in which police incorrectly decide that an innocent suspect is guilty; (b) the *coercion error*, in which police apply accusatory, psychologically manipulative interrogation tactics to coerce suspects into confessing; and (c) the *contamination error*, in which police (inadvertently or intentionally) feed crime-specific details to the suspect that become incorporated into the suspect's confession. In the sections that follow, we explain each error and outline the psychological mechanisms through which trauma can exacerbate youths' risk of falling victim to that error.

The Three Errors framework is useful for several reasons. First, it characterizes the process of coerced and false confessions in a chronological fashion. All accusatorial interrogations (in their most basic form) have a beginning, middle, and end; they begin with the interrogators' presumption of the suspect's guilt, next involve various methods of psychological pressure to obtain a confession, then conclude – post-confession – with constructing a detailed narrative of the suspect's criminal acts and motives. The Three Errors framework highlights the police interrogation tactics that are most concerning, from a trauma response perspective, at each stage of the interrogation. This framework is also useful in its generality; it is not specific to any one school of interrogation. Instead, it characterizes at a high level the mistaken assumptions, trickery,

and psychological manipulation involved in all police-induced false confessions. Finally, this framework reflects – in our experience, and the extensive experience of the scholars who developed it – what coercive interrogations actually look like. We have seen remarkably similar patterns of misclassification, coercion, and contamination in our psychological and legal studies and practices. Irrespective of any single training modality, we are concerned with what happens in actual interrogations and how juveniles with trauma exposure are at heightened risk for unjust outcomes. With these considerations in mind, this article addresses the ways in which trauma symptomatology can exacerbate the vulnerabilities youth suspects already bring into accusatorial interrogations (Cleary, 2017; Crane, 2017).

A. Trauma Can Magnify Adolescent Suspect's Vulnerability to (Mis)classification

The misclassification error occurs when police incorrectly attribute guilt to an innocent person. Leo and Drizin (2010) consider misclassification "both the first and the most consequential error police will make…because misclassifying innocent suspects is a necessary condition for all false confessions and wrongful convictions" (p. 13). Deciding a suspect is guilty represents a critical turning point in the investigative process because it signals a shift away from non-accusatory, factfinding questioning toward accusatory questioning designed to elicit incriminating evidence. That is, police do not intentionally "interrogate" innocent people; rather, they interrogate suspects whom they reasonably believe (via witness identification, crime scene investigation, etc.) are involved in the crime. The ultimate goal of an interrogation, then, is not to obtain investigative information but to elicit a confession (Kassin et al., 2010).

The central psychological miscalculation underlying this error is that interrogators believe they can differentiate innocent suspects from guilty ones by analyzing suspects' verbal responses, nonverbal and paralinguistic behaviors, and dispositions. Interrogation training programs explicitly teach this behavioral approach to lie detection (Leo & Drizin, 2010) and emphatically defend its efficacy (Horvath et al., 2008). Examples include Reid and Associates' Behavioral Analysis Interview (BAI; Inbau et al., 2013), the Forensic Assessment Interview (FAINT; Gordon & Fleisher, 2019), and kinesic interviewing (Walters, 2019). The general idea is that interrogators first ask neutral, irrelevant questions (e.g., demographic information, hobbies) to establish suspects' baseline response patterns. Then interrogators alternate between "investigative" (factfinding) and "behavior provoking" (accusatory) questions. According to behavioral analysis, if suspects' behaviors differ from the former to latter, they are being deceptive, which implies guilt. Although proponents of behavioral lie detection generally concede that no single behavior is diagnostic of truthfulness or deception, they maintain that analyzing behavioral patterns can reveal liars (Horvath at al., 2008; Inbau et al., 2013). Despite some evidence of training benefits, a robust scientific literature reveals large error rates in behavioral lie detection (Driskell, 2012; Hartwig & Bond, 2014).

Behavioral lie detection teaches that nonverbal behaviors such as slouching, gaze aversion, fidgeting, hand wringing, or repetitive head, foot, or leg movements can be indicators of deception (Inbau et al., 2013; Horvath et al., 2008). For example, the Reid Technique training manual asserts that "when a person lies, their fear of detection increases and they have a heightened awareness of how the investigator views them. Consequently, the suspect may inappropriately feel the need to improve their appearance by engaging in grooming behaviors such as picking at clothing or

inspecting fingernails (Inbau et al., 2013, pp. 130-131). "Deceptive" verbal and paralinguistic behaviors include vague or evasive responses, qualifying statements (e.g., *as far as I know*, *not really*), response latency, or terse responses. The Reid Technique asserts that liars "may mumble during a response or talk so quietly that the investigator has difficulty hearing the response" (Inbau et al., 2013, p. 119). Suspect attitudes are also purportedly diagnostic of deception; training programs claim that criminally involved suspects are more likely to appear guarded, defensive, uncooperative, or apathetic (Horvath et al., 2008).

Developmental psychologists have countered that adolescents readily demonstrate behaviors police may consider indicative of guilt, such as slouching or avoiding eye contact, particularly during an uncomfortable or unfamiliar situation like an interrogation by an adult authority figure (Cleary, 2017; Meyer & Reppucci, 2007). These tendencies may be exacerbated in adolescents with trauma symptoms. A disordered stress response system resulting from trauma may render adolescents prone to *overreact* or *underreact* to the stresses of the interrogation environment. Either of these contradictory trauma-related responses could create the appearance of guilt to interrogating officers. While it may seem confusing that trauma can produce such seemingly contradictory behavioral consequences, trauma-related symptomatology is diverse and factor analyses have consistently shown that different clusters of symptoms may predominate in different individuals depending on a variety of personal and contextual factors (Armour et al., 2012; Galatzer-Levy & Bryant, 2013).

Regarding *overreaction*, because adolescents with trauma symptoms are primed to expect danger, they may respond to perceived threats with heightened emotional and physiological responses that could make them appear guilty (Zhu et al., 2020). Adolescents with trauma symptoms may experience persistent negative emotional states such as fear, horror, or anger that are intensified in stressful environments (APA, 2013). In this state of heightened tension, an adolescent with trauma symptoms may display hypervigilance (e.g., constantly swiveling their head in the interrogation room to scan for perceived danger) or demonstrate an exaggerated startle response (e.g., jumping when an officer suddenly closes the door or raises their voice; APA, 2013). For an adolescent with trauma symptoms, such hypervigilance and hyperarousal are attempts at self-protection in what they perceive as an extremely dangerous world and may relate to psychophysiological responses not under their conscious control (Pole, 2007). To police, however, these actions may appear as overly jumpy behavior arising from a guilty conscience. "Tension reduction" activities intended to soothe or distract from this intense anxiety – such as foot-tapping or nail-picking (Briere et al., 2010) – may also be interpreted by police as suspicious self-grooming behaviors.

Distorted cognitions arising from trauma exposure may also prompt adolescents to overreact in the interrogation room in a manner seemingly indicative of guilt. Trauma exposure may lead to a lack of trust toward others as well global expectations of negative outcomes (Cox et al., 2014). These negative, distrustful cognitive appraisals could prompt particularly antagonistic responses to police (e.g., refusing offered snacks or other "friendly" overtures by officers) that may be viewed as suspicious. Further, adolescents with trauma symptoms tend to place excessive blame on themselves for their perceived role in negative events (i.e., "If only I had done X, Y wouldn't have happened"; Cox et al., 2014), which could create a highly emotional response to interrogative pressures that police interpret as a guilty demeanor. As one example, police

investigating the rape and murder of a 15-year-old in 1989 narrowed in on Jeffrey Deskovic, the girl's classmate, in part because 16-year-old Deskovic seemed "overly distraught" at the victim's death, even though he was not involved (Innocence Project, 2021).

These kinds of overreactions may be intensified if an adolescent perceives a trauma cue during the interrogation. A trauma cue is a reminder of a past trauma, including situations, places, people, conversations, sounds, smells, or even internal body states (like fear or tension) that bring to mind a prior traumatic event (Pineles et al., 2013). It is not difficult to imagine myriad ways in which trauma cues may manifest in the interrogation context. For an adolescent who experienced physical or sexual abuse by an adult male, being in close proximity to aggressive male police officers may be a trauma cue. For an adolescent who was confined to a cramped box truck during the immigration process, the small, closed interrogation room may be a trauma cue. For an adolescent whose family or community has experienced police mistreatment, simply being in a police station and interacting with police may be a trauma cue. Further, trauma cues need not be obviously connected to the traumatic event. For an adolescent with a history of violence exposure in any context, a loud noise, a photograph of a crime scene, or any perception of a threat to safety might be trauma cue. When confronted with trauma cues like these, adolescents may experience psychological distress, physiological reactions (such as shaking or nausea), intrusive memories, or even flashbacks[3] and may respond with dramatic, unexpected behaviors (Briere et al., 2005; Pole, 2007). Given that the interrogating officer is likely unaware of the youth's trauma history and the environmental factors serving as trauma cues, these anxious or erratic responses may have no easily discernible explanation besides guilt.

On the other side of the trauma response spectrum, adolescents with trauma histories may *underreact* to the threat of the interrogation room and thus be viewed as indifferent, apathetic, or insincere – which police may also perceive as indicating guilt. Emotional numbing is a common response to traumatic stress; in an attempt to dampen overwhelming negative feelings of fear or horror, the individual becomes unable to express the normal range of emotions, including positive emotions (Kerig et al., 2012). Likewise, adolescents with trauma exposure may experience feelings of detachment or estrangement from others, particularly following traumas with an interpersonal component, such as sexual assault, violence, or sudden death of a loved one (Kelley et al., 2009). Such adolescents may have difficulty forming typical emotional connections with others, including during the social situation comprising an interrogation. A detached, emotionally numb adolescent may be as equally unreactive to the interrogating officer's lighthearted banter as they are to descriptions of the violent crime being investigated, and police officers may view this perceived coldness with suspicion.

Adolescents with trauma histories may also display conditioned immobilization reactions ("freezing") in stressful situations, given that their physiological and hormonal reactions to threat have become ineffective and disorganized (Volchan et al., 2017). For example, an adolescent who has experienced chronic physical or sexual abuse may have learned that "fight" and "flight" are

[3] Flashbacks are dissociative reactions during which a person feels or acts as if the traumatic event were recurring (APA, 2013). For example, a youth experiencing a flashback of prior abuse may be observed to freeze, shake, cry out, or attempt to flee.

not possible, and so has learned to respond to threat by freezing to avoid injury (Thompson et al., 2014), which may come across as suspicious indifference.

Finally, adolescents with trauma symptoms may cope with the stressful interrogation situation via dissociation, an experience of disconnection from themselves or their surroundings (Carrion & Steiner, 2000). For example, an adolescent who is dissociating may feel like the interrogation is not real or feel like they are watching the interrogation happen to another person, as if they were watching a movie. Thus, dissociation can also produce blunted reactivity and disaffected behavior that may lead police to view the adolescent as guilty. While dissociation is relatively rare in adults with PTSD diagnoses, adolescents in the juvenile justice system report dissociation at extremely high rates, likely because they are frequently exposed to the kinds of longstanding interpersonal violence (e.g., sexual or physical abuse by a caregiver) most likely to result in dissociation (Kerig et al., 2016).

B. Trauma Can Magnify Adolescent Suspects' Vulnerability to Coercion

The goal of an interrogation is to secure a confession, and police use many different tactics to achieve that goal. Interrogation is stressful by design; the presumption is that creating a sufficient degree of psychological discomfort will overcome the suspect's resistance and they will eventually admit guilt. Virtually all interrogations that do not involve spontaneous confession will involve some form of active persuasion, even coercion. The courts' challenge lies in determining when active persuasion or coercion becomes so great that it has effectively overborn the will of the suspect, rendering the resultant confession involuntary.

Modern accusatory police interrogation is often described as a two-step process that first involves creating feelings of hopelessness and dejection in the suspect. Interrogators use psychologically manipulative techniques to convince suspects that their guilt is certain and their fate is all but sealed. Then, interrogators offer confession "as an expedient means of escape" from intolerable psychological pressures (Kassin et al., 2010, p. 7). As detailed below, adolescent suspects with trauma symptoms are likely to have decreased resiliency in the interrogation room; thus, their "breaking point" – the point at which they have become so hopeless that they will accept any escape offered by police – may come sooner and be achieved more easily by law enforcement.

Researchers have identified maximization, minimization, and police deception as especially powerful persuasion techniques (Kassin et al. 2010). Maximization techniques are designed to heighten suspects' anxiety, undermine their confidence that they can convince the interrogator they are not guilty, and simply "stress them out." Examples of maximization include accusing the suspect of lying, interrupting or dismissing their denials, emphasizing the severity of the alleged offense or its potential consequences, and invading the suspect's personal space. Minimization, by contrast, involves attempts to build suspects' trust and downplay the seriousness of the situation. Interrogators may offer moral justifications for the crime, blame the victim, or express sympathy with the suspect in the hopes of eliciting a confession.

Moreover, lying to suspects is a standard tactic in American police interrogation practice (Leo, 2008), and some police organizations vehemently maintain that it is a necessary, effective, and legally protected tool in their arsenal (Inbau et al., 2013), even as others are changing laws to

preclude such actions with youth (e.g., Illinois and Oregon recently banned police use of deception with juveniles). Deception can take many forms, the most serious of which is the false evidence ploy, in which interrogators present suspects with supposedly indisputable, but fabricated, evidence of their guilt (e.g., physical evidence such as blood or fingerprints; eyewitness evidence that someone identified them as the perpetrator; "scientific" evidence such as a failed polygraph) as a means to induce confession. In a similar approach called the "bluff tactic," investigators claim to have testable evidence without directly implicating the suspect (Perillo & Kassin, 2011).

Finally, environmental manipulation strategies are highly relevant to suspects with trauma. Modern police interrogation is built on the premise of custodial isolation; police are taught to remove suspects from familiar settings and separate them from support persons (Cleary & Warner, 2016; Inbau et al., 2013). These strategies are carefully orchestrated; for example, police may place juvenile suspects in the corner or against a wall (Cleary, 2014). Police may intentionally leave a suspect sitting alone in the interrogation room in order to heighten their anxiety before questioning even begins. Periods of prolonged detention can involve deprivation of food and sleep by virtue of their length alone, regardless of whether interrogators intentionally withhold these physical comforts as an interrogation strategy. Such physical and mental depletions can impair even psychologically healthy persons' capacities for self-regulation (Davis & Leo, 2012).

In sum, interrogators can coerce suspects to confess with a one-two punch: the intentional production of fear and stress, followed by the promotion of confession as the most expedient solution to end that fear and stress. Trauma responses may magnify suspects' vulnerability to each of these tactics, rendering them more likely to confess either falsely or involuntarily. While any suspect might reasonably be frightened at the prospect of being isolated and accused of a crime, we argue that for a traumatized youth, the experience of fear in a purposefully isolative and oppressive environment would likely be intensified, particularly when compounded by separation from sources of emotional support.

A normative fear response involves a cascade of physiological changes in the face of an acute threat, including activation of the sympathetic nervous system (i.e., "fight or flight" response) and the hypothalamic-pituitary-adrenal (HPA) axis, resulting in a sequence of hormonal and metabolic changes intended to promote survival (McLaughlin et al., 2014). For example, when facing what we appraise as a dangerous stressor, our heart rate, blood pressure, and respiration increase to facilitate explosive action intended to evade or neutralize the threat. Normally, these fear-induced physiological changes reverse after the acute threat has subsided, and the body returns to homeostasis. However, for youth with trauma exposure – particularly chronic exposure to abuse, violence, or other threats – these systems can become chronically activated, resulting in chronic physiological depletion and oversensitivity to environmental stressors (McLaughlin et al., 2014). For example, sympathetic nervous system activation can make the body feel excessively cold or overheated, rendering an adolescent suspect more disturbed by temperature manipulation in the interrogation room. Similarly, heightened physiological arousal after trauma frequently causes sleep disturbance (Charuvastra & Cloitre, 2009), such that youthful suspects with trauma exposure may be more affected by lengthy interrogations without rest.

Beyond an already heightened baseline level of arousal, trauma-related deregulation of the HPA axis can also cause exaggerated reactions to perceived threat – such as an interrogating officer

shouting at them, suggesting they will face years in prison, or presenting (false) evidence that they committed a heinous crime. These exaggerated reactions could render adolescents with trauma symptoms more susceptible to coercive police tactics like maximization and false evidence ploys. For example, children with trauma exposure identify angry faces more quickly and easily and demonstrate amplified neural responses to those angry faces (Pollak & Sinha, 2002). Translated to the courtroom context, a judge or jury viewing a videotaped confession may perceive interrogating officers as relatively benign, while the trauma-exposed adolescent may have perceived those officers as intensely angry and threatening. Additionally, this excessive fear response also degrades a youth's critical thinking abilities (DePrince et al., 2009) – Davis and Leo (2012) compare the effect to well-documented decrements in simple and complex cognition during military combat conditions – rendering youth less able to reason through false evidence ploys.

In general, the heightened fear and stress that youth with trauma symptoms likely experience in the interrogation room may also prime them to accede to minimization tactics, in which officers imply "this could all be over" if only they admit guilt. Beyond this, several specific posttraumatic responses may also render youth more vulnerable to minimization and thus more likely to confess, either falsely or involuntarily. First, avoidance is a hallmark response to traumatic events, since general stress reactivity and trauma cues can create distressing intrusive memories and physiological responses that an individual will take great lengths to avoid (APA, 2013). Thus, while the interrogation context is designed to be uncomfortable for all suspects in order to induce a confession, adolescents with a drive for avoidance may find the situation particularly intolerable and seek relief via confession.

Second, due to a chronically deregulated HPA axis, many youth with chronic trauma histories demonstrate excessively low levels of the stress hormone cortisol, and low cortisol is associated with impulsivity, carelessness, low harm avoidance, and insensitivity to punishment (Nader & Weems, 2011). This may help explain why recklessness is a common posttraumatic symptom that may be particularly relevant among adolescent trauma survivors (Pynoos et al., 2009). Although most prior research has demonstrated a link between adolescent trauma and reckless or delinquent behaviors such as unsafe sexual activity, self-injury, substance use, or risky driving (e.g., Layne et al., 2014), we argue that trauma-affected youth may also display recklessness that results in legal jeopardy – that is, reckless decisions that land them *in* the interrogation room (via *Miranda* waiver) or get them *out* of the interrogation room (via coerced or false confessions). Adolescents with trauma symptoms may respond to interrogative pressure by making reckless admissions (whether true or false) due to impaired abilities to detect risk, attempts to distract from upsetting thoughts and feelings, or desires to re-assert feelings of control and self-efficacy (see, generally, Kerig, 2019).

Finally, adolescents with trauma symptoms may be more susceptible to coercion due to increased compliance. Compliance, or the tendency to accede to requests or demands, is certainly relevant to interrogations because typical maximization techniques involve police repeatedly demanding that the suspect "tell the truth" and interrupting all denials or explanations. In correlational research with community adults, both Drake (2010) and Gudjonsson et al. (2011) reported associations between a history of negative life events and increased compliance. Gudjonsson et al. (2011) proposed that the association is mediated by an insecure attachment style, which is correlated with childhood maltreatment. Insecurely attached individuals may engage in

desperate attempts to win or retain approval of a respected other, leading them "to prioritize relationship preservation over self-protection" (Noll & Grych, 2011, p. 206) – including, perhaps, by confessing to an interrogating officer in order to win approval or avoid disapproval. A more straightforward explanation of the posited link between juvenile trauma impact and compliance may be that chronically abused children may have learned to respond to threat with "mechanistic compliance or resigned submission," absent other effective options to help them escape past abuse (Van Der Kolk, 2006, p. 7).

C. How Trauma Can Magnify Adolescent Suspects' Vulnerability to Contamination

Interrogations do not end the moment a suspect confesses. Once a suspect admits guilt, the interrogator endeavors to elicit a detailed narrative explaining the suspect's motives and actions. Police are trained that a mere "I did it" admission has less evidentiary value than one accompanied by a post-admission narrative that includes detailed information about where, when, how, and why the suspect committed the crime (Inbau et al., 2013). Confession contamination occurs when non-public information about the crime – details known only to police and the true perpetrator – are provided to the suspect and then become incorporated into the suspect's eventual confession. Scholars and police officials universally agree that confession contamination is a negative investigative outcome that should be avoided (Garrett, 2015; Inbau et al., 2013).

Contamination can occur if the suspect has consciously or unconsciously consumed details about the case from local media, community gossip, or interrogators themselves (Leo & Drizin, 2010). For example, police may present suspects with anything from basic facts of the incident (e.g., location, time of day) to crime scene photos, murder weapons, or surveillance footage. An interrogator may share such information as part of an effort to assure a suspect that police already know about and can prove the suspect's involvement in the crime. When the suspect is actually innocent, however, it has the unintended effect of feeding them crime-specific details, which may be later incorporated into a false narrative. In their eagerness to document a thorough confession narrative, interrogators may inadvertently communicate case information as they attempt to elicit missing details from a suspect's account or document what they believe will yield a narrative most likely to lead to a finding of guilt (Leo, 2013). Interrogators often adopt a question-and-answer format for the confession narrative, especially if they are using a recording device to document the confession. As during the interrogation itself, interrogators eliciting the confession narrative may use leading or suggestive questions and/or negative feedback in their attempt to elicit a story that is consistent with their expectations of the suspect's guilt (Leo & Drizin, 2010). As part of minimization strategies earlier in the interrogation, police may have already suggested motives or explanations for the crime – often ones that are somewhat morally palatable or relatable – that cognitively depleted suspects may readily adopt, even if they are inaccurate.

All of the potential trauma-related mechanisms discussed in relation to coercion also apply to contamination if an adolescent knowingly makes false statements about crime details in an attempt to accelerate their release or please interrogators. These mechanisms may become increasingly powerful by the time interrogators press the juvenile suspect for a post-admission narrative, which typically occurs at the end of an active interrogation or custodial detention period that could span many hours or even days. Davis and Leo (2012) argue that a suspect's abilities to resist the powerful pressures of the interrogation context decrease over time as the individual's

self-regulatory abilities deteriorate, a process they term "interrogation-related regulatory decline." Cognitively-depleted suspects become less able to persevere in the interrogation context over time as they gradually lose the abilities to focus on relevant information, ignore irrelevant information, access information from long-term memory, and hold information in working memory (Davis & Leo, 2012).

These domains overlap with the cognitive deficits commonly experienced by adolescents impacted by trauma, suggesting that these youth may be particularly vulnerable to interrogation-related regulatory decline. Available evidence indicates that adolescents impacted by trauma experience impairments in attention, abstract reasoning, working memory, processing speed, inhibitory control, and academic abilities (MacDonald et al., 2011). Individuals with depleted self-regulatory abilities become more passive and likely to acquiesce to the "default" option rather than exert the mental effort necessary to actively challenge that default (Baumeister et al., 2008). Thus, by the end of an exhausting, emotionally fraught interrogation, adolescents with trauma symptoms may become even more likely to acquiesce to details suggested by interrogators during the post-confession narrative (e.g., "And then you grabbed the knife?" "Yes." "And then you stabbed her three times?" "Yes.").

Confession contamination can also operate outside an adolescent suspect's conscious awareness or volition via interrogative suggestibility, the extent to which individuals "come to accept messages communicated during formal questioning" (Gudjonsson & Clark, 1986, p. 84). If an adolescent comes to believe, to some degree, the offense details suggested by the interrogator or other external sources, they may offer what is known as an internalized or persuaded false confession (Kassin et al., 2010). While internalized false confessions are probably far less common than compliant false confessions (Sigurdsson & Gudjonsson, 1996), adolescents with trauma symptoms may be at particular risk of this type of false admission. Correlational laboratory studies show that the more traumatic events a youth has experienced, the more likely they are to alter the details of their recalled account in response to the experimenter's leading questions and negative feedback (e.g., Drake et al., 2008).

Cognitive deficits associated with trauma exposure may explain the link between adolescents' trauma symptoms and interrogative suggestibility, whether youth are offering a fully internalized false confession or incorporating false details into a true confession (i.e., an unreliable confession). When an adolescent suspect has poor memory or doubts their own memory, they may be more prone to yield to leading questions and negative feedback (Gudjonsson & Clark, 1986). This may be particularly true of adolescents with trauma symptoms, who may experience ongoing deficits in autobiographical and prospective memory (Dalgleish et al., 2005). Indeed, if the event under investigation was itself traumatic for the adolescent (e.g., death of a family member; exposure to an armed robbery, shooting, or fatal accident), dissociative amnesia can render the youth unable to remember important aspects of the incident (Choi et al., 2017). Other research has linked ongoing dissociative symptoms – which are common among system-involved adolescents, and which can also disrupt memory – to suggestibility (Chae et al., 2011; Eisen et al., 2007). Unsurprisingly, memory impairment worsens when an individual is experiencing dysfunctional, trauma-related cognitions (Schweizer & Dalgleish, 2011), which may be particularly likely to occur in a threatening interrogation context replete with potential trauma cues. Further, trauma-related failures in attention, memory, and inhibition of automatic responses may impair adolescents' ability to actively monitor the source of crime details to which they have been

exposed, thus rendering them more likely to offer contaminated details as their own (Henkel & Coffman, 2004).

V Trauma Symptomatology: Another Dispositional Risk Factor?

Thus far, we have theorized mechanisms by which adolescents' trauma responses can render them vulnerable to involuntary or false confessions via "three errors" of police interrogation: misclassification, coercion, and contamination. We also argue that trauma impact can introduce additive or interactive effects on interrogation vulnerability when combined with other dispositional risk factors for coerced or false confessions that have already been identified in the literature. Here, we briefly hypothesize how trauma symptomatology could feasibly interact with three of the most well-known dispositional risk factors – adolescence, cognitive impairment, and psychopathology[4] – in hopes of inspiring new research in this area. The high likelihood of overlapping dispositional risk factors (including potential trauma symptomatology) among system-involved youth renders additional investigation extremely important.

Regarding adolescence, abundant scholarship has linked adolescents' psychosocial immaturity to their poor legal decision making, including interrogation decision making (Cleary, 2017; Goldstein et al., 2018). While a detailed discussion of developmental immaturity is beyond the scope of this article, we note here that, generally, adolescents exhibit a broad array of developmentally based differences from adults in term of their functioning in challenging circumstances. This includes comparatively poor judgment, problem-solving, and logical reasoning under emotional stress; impulsivity in thinking and behavior; immaturity and lack of real-world experience; vulnerability to pressures from peers or authority figures; and limited appreciation of long-term consequences despite the cognitive capacity to understand (National Academies of Sciences, Engineering, and Medicine, 2019). Although individual differences in psychosocial maturity exist, an extraordinary body of developmental science demonstrates that psychosocial immaturity is the norm during adolescence and that immaturity manifests in legally relevant ways (see, generally, Steinberg, 2017). Specifically, large-scale research with serious juvenile offenders shows that psychosocial immaturity in this population persists to the mid-twenties and that youth who continued engaging in antisocial behavior throughout this developmental period were less psychosocially mature than youth who desisted from antisocial behavior (Monahan et al., 2013). Thus, an adolescent suspect impacted by trauma may then be additionally challenged, as both developmental status and trauma-related emotions and cognitions create vulnerabilities in the interrogation room. This compounded vulnerability may well be the rule rather than the exception; more than 90% of system-involved youth have histories of trauma exposure and up to half of these youth demonstrate posttraumatic symptoms that are severe enough to meet formal diagnostic criteria for PTSD (Dierkhising et al., 2013).

Trauma symptomatology may also interact with intellectual disability or cognitive impairment to increase adolescents' vulnerability to involuntary and false confessions. Suspects

[4] While dispositional risk factors such as adolescence, cognitive impairment, and psychopathology are perhaps the best understood at the moment (Kassin et al., 2010), emerging work identifies other individual correlates of false confessions (Gudjonsson, 2021; Gudjonsson, 2018).

with limited intellectual capacity are already less able to meet the cognitive demands of the interrogation context, recognize the underlying motivation of an investigator, reason effectively when emotionally activated, critically evaluate false evidence ploys, or consider future consequences of immediate decision-making. Given that youth with intellectual disability are at high risk for physical abuse, sexual abuse, and other kinds of maltreatment (McDonnell et al., 2019), adolescents with cognitive impairment may be particularly likely to experience trauma and its consequences. Youth with intellectual disability are also overrepresented in the juvenile justice system (Foley, 2001). For youth with both intellectual disability and trauma symptomatology, the trauma-related cognitive deficits reviewed above may overlap with existing cognitive limitations, thus amplifying the vulnerability of these youth in the interrogation room.

Finally, a variety of forms of psychopathology have been linked to false confession (Kassin et al., 2010). Some of the same cognitive and behavioral challenges that characterize many psychiatric disorders generally – such as perceptual distortions, poor impulse control, impaired self-regulation, and reactivity to stress – are the same challenges that impair interrogation decision making (Kassin et al., 2010). As discussed, trauma symptomatology can result in impairment in these same domains, creating compounded risk of false or involuntary confessions for youth with comorbid trauma symptoms and other psychiatric disorders. Again, the likelihood of overlapping vulnerabilities is high, as system-involved youth have elevated rates of mental disorder generally (Fazel et al., 2008), and the vast majority of youth with trauma symptoms also qualify for another psychiatric diagnosis (Copeland et al., 2007; Kilpatrick et al., 2003).

VI Implications for Psychological Research

The hypotheses advanced in this article suggest multiple avenues of research to elucidate the role of adolescent trauma symptomatology during interrogations. At the very least, trauma history and symptomatology can be incorporated into existing confession research paradigms. Archival studies can code for indicators of trauma history and symptoms as they already have for intellectual disabilities (Schatz, 2018) and psychopathology (Garrett, 2015). Self-report studies with adolescents can incorporate trauma history and symptoms in questionnaires or interviews, as can lab studies examining self-regulatory abilities during interrogations (e.g., Guyll et al., 2013). Additionally, following the pioneering work of Gudjonsson and colleagues, population-based research could be conducted with American adolescents to explore associations between confession experiences and trauma exposure or impact, given known differences between interrogation practices and system-involvement rates between Europe and the U.S. (Miller et al., 2018; Muncie & Goldson, 2006). Finally, interrogation research can – in a compassionate and ethical manner – purposively sample youth seeking treatment for traumatic stress to conduct vignette or self-report studies of police interrogation, including qualitative studies that can help clarify the nascent concepts proposed in this paper.

Research should also move beyond a dichotomous conceptualization of trauma as "present" or "absent" to explore the specific mechanisms by which trauma may create interrogation vulnerabilities, as well as specific types or elements of trauma and posttraumatic symptomatology most likely to increase vulnerability. Checklists of negative life events are sometimes blunt instruments to measure trauma, given that even youth exposed to many traumatic

events may have no symptoms (Copeland et al., 2007) and that posttraumatic reactions, when they do occur, are highly heterogeneous (Galatzer-Levy & Bryant, 2013). Reducing trauma measurement to counts of events can create misleading results by conflating diverse and potentially contradictory trauma responses (e.g., predominant recklessness vs. predominant avoidance) in the same variable. Thus, life event checklists, while an important foundation, do not permit fine-grained analysis of which specific posttraumatic changes might explain increased vulnerability to involuntary or false confessions. Future research on interrogation vulnerability could incorporate more sophisticated trauma symptom inventories for youth (e.g., UCLA Child/Adolescent PTSD Reaction Index for DSM–5; Clinician-Administered PTSD scale for DSM-5 – Child/Adolescent Version; Trauma Symptom Checklist for Children) to assess differential patterns of symptomatology, as well as different types of trauma, chronicity of trauma, and recency of trauma. Such research should pay particular attention to whether the offense under investigation qualifies as a traumatic event for the youth, as this situation could create unique dynamics in the interrogation room (Welfare & Hollin, 2012). Research on these issues should also consider cultural differences in trauma expression and choose assessment instruments accordingly (Hinton & Lewis-Fernández, 2011).

VII Considerations for Law, Policy, and Practice

Thus far, this article has delineated adolescents' clinical responses to trauma exposure and used the Three Errors framework of police-induced false confessions to propose mechanisms through which trauma symptomatology could exacerbate youths' vulnerability to misclassification, coercion, and/or contamination during police interrogations. It offers numerous empirically informed hypotheses in need of rigorous empirical testing. We acknowledge that specific policy or practice recommendations are premature in the absence of strong scientific support. However, while we wait for researchers to answer the call, it seems imprudent to ignore the theoretical link between trauma symptomatology and false or involuntary juvenile confessions given existing correlational findings that trauma symptoms can impact youths' behavior during interrogations, as well as basic science indicating that known trauma responses are akin to those characteristics already known to increase interrogative vulnerability. Accordingly, we conclude by discussing potential implications of the proposed trauma-confession link for the various actors and systems with decision-making authority and the potential to reduce further harm.

A. Courtroom Considerations

If emerging research supports a link between trauma symptomatology and adolescents' confession decision-making, the law regarding interrogation and confessions could more directly address the role of trauma in the interrogation room. First, trauma could be a factor considered by judges in the totality of the circumstances analysis applied when evaluating the voluntariness of a confession (Crane, 2017). Totality of the circumstances tests require courts to weigh factors relating to police conduct against traits of the individual suspect (*Schneckloth v. Bustamonte*, 1973). Courts already consider age, experience with law enforcement, education, background, and intelligence; trauma history and symptoms could be included in the list of suspect factors that all courts must consider in the totality analysis for juveniles' confession voluntariness.

Second, in the few cases where courts are known to have considered trauma in voluntariness analyses and related suppression motions, the analysis has been narrowly confined to cases where the suspect had a formal diagnosis of PTSD or was clearly exhibiting the most dramatic and widely recognized symptoms of PTSD (e.g., flashbacks) during the interrogation (Crane, 2017). This approach is too narrow because, as explained above, many adolescents experiencing impacts from their trauma histories may not formally qualify for a PTSD diagnosis, or even if they do, they may not have been diagnosed with PTSD at the time of the interrogation. Reliance on formal PTSD diagnoses also oversimplifies the consequences of trauma and thus fails to recognize the diverse and often more subtle ways that trauma and its sequalae are highly relevant to juvenile interrogations. Many of the hallmark trauma responses detailed above will not be as visible as, for example, a flashback, but can still be extremely impairing to a juvenile suspect.

Finally, defense attorneys can investigate and account for trauma history and symptoms in their case work-up of juvenile clients who confessed (Crane, 2017). Attorneys can retain experts to evaluate the adolescent defendant for trauma symptoms and testify regarding how the defendant's trauma is specifically relevant to their behavior in the interrogation room and their susceptibility to giving a false or involuntary confession. Ideally, a defense attorney will cohere a compelling history of the juvenile's trauma and a digestible explanation of how that trauma impacts the juvenile's cognition and behavior (Denno, 2019).

B. Forensic Evaluation Considerations

Forensic mental health professionals evaluating confession reliability and voluntariness should consider the possibility that trauma symptoms contributed to an adolescent's vulnerability to coercive interrogation tactics. The analysis could include consideration of trauma both as an independent dispositional variable and in interaction with other risk factors, particularly developmental immaturity. History of exposure to trauma and trauma responses should each be considered. Consideration of trauma exposure should go beyond simply identifying whether the individual has been exposed to potentially traumatic events and include the nature, frequency, and developmental context and consequences of such events, individually and in the aggregate. Attention should be given to the degree to which supports that might have moderated the effects of the exposure were provided, as well as the degree to which the individual's responses suggest that the event(s) continued to exert an influence of emotions, perceptions, and behavior at the time of the interrogation.

As discussed, trauma responses may be associated with clinical diagnoses including PTSD, but they may also be present in ways that are not directly associated with a clinical diagnosis, in which case describing their impact on functioning may be especially important. However, regardless of whether trauma responses are linked to a diagnosis, describing how those responses appear to have created vulnerability, and any ways that such vulnerability was exploited in an interrogation, may be especially important.

Trauma history and symptomatology should thus be routinely assessed during the evaluation process, and to the extent it is relevant in a particular case, discussed with the attorney who sought the evaluation. That means discussing the potential role of trauma early in the process to ensure that sufficient efforts are made to obtain relevant information. It also requires analyzing

any contribution of trauma to the individual's interrogative vulnerability generally and in the course of the interrogation itself. As noted above, forensic mental health clinicians are well-situated to educate the legal community about the implications of trauma exposure for evaluation of confession evidence.

C. Law Enforcement Considerations

Police have authority to implement interrogation reforms that could substantially reduce coerced or false confessions from trauma-exposed youth. Given what we know about how trauma symptomatology affects youths' perceptions and decision-making, police departments could consider prohibiting the use of manipulative interrogation techniques, especially deception about evidence or potential consequences (given trauma's comorbidity with intellectual disability and cognitive and memory sequelae), maximization (given trauma-exposed youths' recklessness and hyperresponsiveness to threats), and minimization and implied leniency (given their drive for avoidance and impaired ability to detect risk). Police departments should also consider eliminating behavioral analysis with juvenile suspects, given that trauma-exposed youths' unique response patterns can yield misleading information. Police departments could also adopt elements of trauma-informed investigative interviewing approaches already in use for child victims and witnesses, such as the NICHD Investigative Interview Protocol (Lamb et al., 2007). Such protocols were developed with the understanding that vulnerable populations are more likely to provide inaccurate or incomplete information, and the same principle applies for trauma-exposed juvenile suspects. After all, it is ultimately in law enforcement's best interest to elicit accurate information from suspects. Finally, as explicated by many other psychologists and legal scholars (e.g., Kassin et al., 2010), videorecording interrogations in their entirety would permit attorneys and expert-witness psychologists to conduct a thorough review of interrogation practices and suspect responses, assisting triers of fact with their evaluations of the interrogation and confession. This may be of particular importance for youth with specific vulnerabilities such as trauma impact. All of these law enforcement reforms would not only protect vulnerable youth but would also improve the integrity and success of the investigative process. Importantly, police departments are empowered to enact these reforms on their own, irrespective of state legislative mandates.

D. Interrogation Policy Considerations

If trauma impact is indeed a dispositional risk factor for involuntary or false juvenile confessions, there are myriad implications for the juvenile and criminal justice systems, including police interrogators, defense attorneys representing juvenile confessors, prosecutors deliberating whether and/or how to charge a case, and judges deciding cases involving juvenile confessions. From a purely probabilistic perspective, it can be assumed that the majority of youth who find themselves in the interrogation room both exhibit psychosocial immaturity and have experienced trauma. In other words, given the overrepresentation of trauma exposure, cognitive impairment, and psychiatric disorders among system-involved adolescents, the statistical likelihood of an adolescent suspect having *at least* two of these known (or suspected) dispositional risk factors for false confessions is all but assured, and a great many will have more than that. Moreover, given that trauma exposure is not readily discernible – you cannot "see" trauma – any recommendations for police to interrogate suspects differently purely based on identified trauma history would be misguided. Given these realities, blanket policies relevant to all adolescent suspects may be needed

to reduce the risk of false, involuntary, or unreliable confessions from youth with trauma impact. For example, implementing a nonwaivable right to counsel prior to interrogation may be advisable to protect trauma-exposed youth. Such measures have already been implemented in at least two states. In 2016, Illinois amended its Juvenile Court Act to require that children under the age of 15 accused of sex crimes and homicides must be represented by counsel during custodial interrogations (Illinois Public Act 99-0882). In 2017, California's Senate Bill 395 stipulated that "prior to a custodial interrogation, and before the waiver of any Miranda rights, a youth 15 years of age or younger shall consult with legal counsel in person, by telephone, or by video conference. The consultation may not be waived" (California Welfare & Institutions Code, 2017). In September 2020, California's governor signed into law an amended statute raising the age of mandatory consultation with counsel from 15 to 18, such that all juveniles in California now have a non-waivable right to counsel prior to custodial interrogation.

Finally, no discussion of adolescents, interrogation, and trauma could be complete without considering the potential of the interrogation itself to traumatize or re-traumatize adolescents. The interrogation interaction can be a source of extreme stress, so numerous advocacy organizations focused on the "do no harm" principle have emerged to bridge the gap between the criminal justice and public health systems, recognizing that justice system contact exacerbates mental health problems (Jackson et al., 2019; Sugie & Turney, 2017). Curtailing whether, how, and for how long juvenile interrogations occur may therefore be advisable not only from a harm reduction perspective but even a cost reduction perspective, given the extraordinary financial and social costs of wrongful convictions stemming from false confessions (Gutman, 2017).

VIII Conclusion

Many psychological constructs struggle to obtain legitimacy in legal settings, often relegated to "buzzwords" or trends that do not permeate system decision making in a sustained manner, despite robust empirical support. Trauma has certainly gained traction in other domains of the criminal justice process, from juvenile diversion to trauma-informed correctional programming. But with respect to police interrogation – a gateway to the criminal justice system – trauma symptomatology has received short shrift at best and complete disregard at worst. It is time for courts, defense attorneys, prosecutors, forensic psychologists, interrogation researchers, and police departments to reckon with the reality that most adolescents who experience police interrogation have trauma histories as well as the emerging possibility that resulting trauma symptoms can play a critical role in the interrogation room and beyond. We cannot expect fairness for adolescent suspects or accurate confession information for police if, as proposed here, trauma symptomatology increases vulnerability to false or involuntary confessions but remains unaddressed by legal stakeholders.

References

Abram, Karen M., Teplin, Linda A., King, Devon C., Longworth, Sandra L., …Olson, Nichole D. (2013). PTSD, trauma, and comorbid psychiatric disorders in detained youth. *U. S.*

Department of Justice: Office of Juvenile Justice and Delinquency Prevention, online: https://www.ojjdp.gov/pubs/239603.pdf.

Abrantes, Ana M., Hoffmann, Norman G., & Anton, Ronald. (2005). Prevalence of co-occurring disorders among juveniles committed to detention centers. *International Journal of Offender Therapy and Comparative Criminology*, *49*(2), 179-193, online: https://doi.org/10.1177%2F0306624X04269673.

Alceste, Fabiana, Luke, Timothy J., Redlich, Allison D., Hellgren, Johanna, Amrom, Aria D., & Kassin, Saul M. (2020). The psychology of confessions: A comparison of expert and lay opinions. *Applied Cognitive Psychology*, 1-13, online: https://doi.org/10.1002/acp.3735.

American Bar Association (2018). ABA Commission on Youth At Risk report to the House of Delegates, online: https://www.americanbar.org/groups/public_interest/child_law/resources/.

American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Publisher.

Armour, Cherie, Elhai, Jon D., Richardson, Don, Ractliffe, Kendra, Wang, Li, & Elklit, Ask. (2012). Assessing a five factor model of PTSD: Is dysphoric arousal a unique PTSD construct showing differential relationships with anxiety and depression? *Journal of Anxiety Disorders*, *26*(2), 368-376, online: https://doi.org/10.1016/j.janxdis.2011.12.002.

Baumeister, Roy F., Sparks, Erin A., Stillman, Tyler F., & Vohs, Kathleen D. (2008). Free will in consumer behavior: Self-control, ego depletion, and choice. *Journal of Consumer Psychology*, *18*(1), 4–13, online: https://doi.org/10.1016/j.jcps.2007.10.002.

Briere, John, Hodges, Monica, & Godbout, Natacha. (2010). Traumatic stress, affect dysregulation, and dysfunctional avoidance: A structural equation model. *Journal of Traumatic Stress*, *23*(6), 767–774, online: https://doi.org/10.1002/jts.20578.

Briere, John, Scott, Catherine, & Weathers, Frank. (2005). Peritraumatic and persistent dissociation in the presumed etiology of PTSD. *American Journal of Psychiatry*, *162*(12), 2295–2301, online: https://doi.org/10.1176/appi.ajp.162.12.2295.

Brown v. Mississippi, 297 U.S. 278 (1936).

Bryant, Richard A., Friedman, Matthew J., Spiegel, David, Ursano, Robert, & Strain, James. (2011). A review of acute stress disorder in DSM-5. *Focus*, *9*(3), 335-350, online: https://doi.org/10.1176/foc.9.3.foc335.

California Welfare & Institutions Code, Ca. Stat. § 625.6 (2017), online: https://leginfo.legislature.ca.gov/faces/billStatusClient.xhtml?bill_id=201720180SB395.

Carrion, Victor G., & Steiner, Hans. (2000). Trauma and dissociation in delinquent adolescents. *Journal of the American Academy of Child & Adolescent Psychiatry*, *39*(3), 353–359, online: https://doi.org/10.1097/00004583-200003000-00018.

Cauffman, Elizabethi, Feldman, Shirley, Watherman, Jaime, & Steiner, Hans. (1998). Posttraumatic stress disorder among female juvenile offenders. *Journal of the American Academy of Child & Adolescent Psychiatry*, *37*(11), 1209-1216, online: https://doi.org/10.1097/00004583-199811000-00022.

Chae, Yoojin, Goodman, Gail S., Eisen, Mitchell L., & Qin, Jianjian. (2011). Event memory and suggestibility in abused and neglected children: Trauma-related psychopathology and cognitive functioning. *Journal of Experimental Child Psychology*, *110*(4), 520–538, online: https://doi.org/10.1016/j.jecp.2011.05.006.

Charuvastra, Anthony, & Cloitre, Marylene. (2009). Safe enough to sleep: Sleep disruptions associated with trauma, posttraumatic stress, and anxiety in children and adolescents. *Child and Adolescent Psychiatric Clinics of North America*, *18*(4), 877–891, online: https://doi.org/10.1016/j.chc.2009.04.002.

Choi, Kristen R., Seng, Julia S., Briggs, Ernestine C., Munro-Kramer, Michelle L., Graham-Bermann, Sandra A., Lee, Robert C., & Ford, Julian D. (2017). The dissociative subtype of posttraumatic stress disorder (PTSD) among adolescents: Co-occurring PTSD, depersonalization/derealization, and other dissociation symptoms. *Journal of the American Academy of Child & Adolescent Psychiatry*, *56*(12), 1062-1072, online: https://doi.org/10.1016/j.jaac.2017.09.425.

Cleary, Hayley. (2017). Applying the lessons of developmental psychology to the study of juvenile interrogations: New directions for research, policy, and practice. *Psychology, Public Policy, and Law, 23*(1), 118-130, online: https://doi.org/10.1037/law0000120.

Cleary, Hayley. (2014). Police interviewing and interrogation of juvenile suspects: A descriptive examination of actual cases. *Law and Human Behavior, 38*(3), 271-282, online: https://doi.org/10.1037/lhb0000070.

Cleary, Hayley & Warner, Todd C. (2016). Police training in interviewing and interrogation methods: A comparison of techniques used with adult and juvenile suspects. *Law and Human Behavior, 40*(3), 270-284, online: https://doi.org/10.1037/lhb0000175.

Cook, Alexandra, Spinazzola, Joseph, Ford, Julian, Lanktree, Cheryl, Blaustein, Margaret, Cloitre, Marylene, DeRosa, Ruth, Hubbard, Rebecca, Kagan, Richard, & Liautaud, Joan. (2005). Complex trauma in children and adolescents. *Psychiatric Annals*, *35*(5), 390–398, online: https://doi.org/10.3928/00485713-20050501-05.

Copeland, William E., Keeler, Gordon, Angold, Adrian, & Costello, E. J. (2007). Traumatic events and posttraumatic stress in childhood. *Archives of General Psychiatry*, *64*(5), 577-584, online: http://dx.doi.org/10.1001/archpsyc.64.5.577.

Cox, Keith S., Resnick, Heidi S., & Kilpatrick, Dean G. (2014). Prevalence and correlates of posttrauma distorted beliefs: Evaluating DSM-5 PTSD expanded cognitive symptoms in a national sample. *Journal of Traumatic Stress, 27*(3), 299–306, online: https://doi.org/10.1002/jts.21925.

Crane, Megan G., (2017). Childhood trauma's lurking presence in the juvenile interrogation room and the need for a trauma-informed voluntariness test for juvenile confessions. *South Dakota Law Review*, *62*, 626-672.

Dalenberg, Constance J., Straus, Elizabeth, & Carlson, Eve B. (2017). Defining trauma. In S. N. Gold (Ed.), *APA Handbook of Trauma Psychology: Volume 1. Foundations in Knowledge.* (pp. 15-33). American Psychological Association.

Dalgleish, Tim, Meiser-Stedman, Richard, & Smith, Patrick. (2005). Cognitive aspects of posttraumatic stress reactions and their treatment in children and adolescents: An empirical review and some recommendations. *Behavioural and Cognitive Psychotherapy*, *33*(4), 459–486, online: https://doi.org/10.1017/S1352465805002389.

Davis, Deborah, & Leo, Richard A. (2012). Interrogation-related regulatory decline: Ego depletion, failures of self-regulation, and the decision to confess. *Psychology, Public Policy, and Law*, *18*(4), 673–704, online: https://doi.org/10.1037/a0027367.

DeBellis, Michael D., & Zisk, Abigail. (2014). The biological effects of childhood trauma. *Child & Adolescent Psychiatric Clinics of North America, 23*, 185-222, online: https://doi.org/10.1016/j.chc.2014.01.002.

Denno, Deborah W. (2019). How courts in criminal cases respond to childhood trauma. *Marquette Law Review, 103*(2), 301-363.

DePrince, Anne P., Weinzierl, Kristin M., & Combs, Melody D. (2009). Executive function performance and trauma exposure in a community sample of children. *Child Abuse & Neglect*, *33*(6), 353–361, online: https://doi.org/10.1016/j.chiabu.2008.08.002.

Dierkhising, Carly B., Ko, Susan J., Woods-Jaeger, Briana, Briggs, Ernestine C., Lee, Robert, & Pynoos, Robert S. (2013). Trauma histories among justice-involved youth: Findings from the National Child Traumatic Stress Network. *European Journal of Psychotraumatology*, *4*(1), 20274, online: https://doi.org/10.3402/ejpt.v4i0.20274.

Dixon, Angela, Howie, Pauline, & Starling, Jean. (2005). Trauma exposure, posttraumatic stress, and psychiatric comorbidity in female juvenile offenders. *Journal of the American Academy of Child & Adolescent Psychiatry*, *44*(8), 798-806, online: https://doi.org/10.1097/01.chi.0000164590.48318.9c.

Drake, Kim E. (2010). Interrogative suggestibility: Life adversity, neuroticism, and compliance. *Personality and Individual Differences*, *48*(4), 493–498, online: https://doi.org/10.1016/j.paid.2009.11.030.

Drake, Kim E., Bull, Ray, & Boon, Julian C. W. (2008). Interrogative suggestibility, self-esteem, and the influence of negative life-events. *Legal and Criminological Psychology*, *13*(2), 299–307, online: https://doi.org/10.1348/135532507X209981.

Drake, Kim E., Gudjonsson, Gisli H., Sigfusdottir, Inga D., & Sigurdsson, Jon F. (2015). An investigation into the relationship between the reported experience of negative life events, trait stress-sensitivity and false confessions among further education students in Iceland. *Personality and Individual Differences*, *81*, 135–140, online: https://doi.org/10.1016/j.paid.2014.09.007.

Driskell, James E. (2012). Effectiveness of deception detection training: A meta-analysis. *Psychology, Crime & Law*, *18*, 713–731, online: https://doi.org/10.1080/1068316X.2010.535820.

Drizin, Steven A., & Colgan, Beth A. (2004). Tales from the juvenile confession front: A guide to how standard police interrogation tactics can produce coerced and false confessions from

juvenile suspects. In G. D. Lassiter (Ed.), *Interrogations, confessions, and entrapment*, 127–162, Kluwer.

Drizin, Steven A., & Leo, Richard A. (2004). The problem of false confessions in the post-DNA world. *North Carolina Law Review*, *82*, 891-1007.

Eisen, Mitchel L., Goodman, Gail S., Qin, Jianjian, Davis, Suzanne, & Crayton, John. (2007). Maltreated children's memory: Accuracy, suggestibility, and psychopathology. *Developmental Psychology*, *43*(6), 1275, online: https://doi.org/10.1037/0012-1649.43.6.1275.

Fairbank, John A., Putnam, Frank W., & Harris, William W. (2014). Child traumatic stress: Prevalence, trends, risk, and impact. In *Handbook of PTSD: Science and practice, 2nd ed* 121–145, The Guilford Press.

Fazel, Seena, Doll, Helen, & Långström, Niklas. (2008). Mental disorders among adolescents in juvenile detention and correctional facilities: A systematic review and metaregression analysis of 25 surveys. *Journal of the American Academy of Child & Adolescent Psychiatry*, *47*(9), 1010–1019, online: https://doi.org/10.1097/CHI.ObO13e31817eecf3.

Felitti, Vincent J., Anda, Robert F., Nordenberg, Dale, Williamson, David F., Spitz, Alison M., Edwards, Valerie, Koss, Mary P., & Marks, James S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, *14*, 245–258, online: https://doi.org/10.1016/S0749-3797(98)00017-8.

Foley, Regina M. (2001). Academic characteristics of incarcerated youth and correctional educational programs: A literature review. *Journal of Emotional and Behavioral Disorders*, *9*(4), 248–259, online: https://doi.org/10.1177/106342660100900405.

Galatzer-Levy, Isaac R., & Bryant, Richard A. (2013). 636,120 ways to have posttraumatic stress disorder. *Perspectives on Psychological Science*, *8*(6), 651–662, online: https://doi.org/10.1177/1745691613504115.

Garrett, Brandon L. (2015). Contaminated confessions revisited. *Virginia Law Review*, *101*, 395–454.

Giaconia, Rose M., Reinherz, Helen Z., Silverman, Amy B., Pakiz, Bilge, Frost, Abbie K., & Cohen, Elaine. (1995). Traumas and posttraumatic stress disorder in a community population of older adolescents. *Journal of the American Academy of Child & Adolescent Psychiatry*, *34*(10), 1369-1380, online: https://doi.org/10.1097/00004583-199510000-00023.

Goldstein, Naomi E., Haney-Caron, Emily, Levick, Marsha, & Whiteman, Danielle. (2018). Waving good-bye to waiver: A developmental argument against youths' waiver of Miranda rights. *N.Y.U. Journal of Legislation & Public Policy*, *21*, 1-67.

Gordon, Nathan, & Fleisher, William. (2019). *Effective interviewing techniques* (4th ed.) London: Elsevier.

Grisso, Thomas, Steinberg, Lawrence, Woolard, Jennifer, Cauffman, Elizabeth, Scott, Elizabeth S., Graham, Sandra, Lexcen, Fran, Reppucci, N. D., & Schwartz, Robert. (2003). Juveniles'

competence to stand trial: A comparison of adolescents' and adults' capacities as trial defendants. *Law and Human Behavior*, *27*, 333-363, online: https://doi.org/10.1023/A:1024065015717.

Gudjonsson, Gisli H., & Clark, Noel K. (1986). Suggestibility in police interrogation: A social psychological model. *Social Behaviour*, *1*(2), 83–104.

Gudjonsson, Gisli H., Sigurdsson, Jon F., & Tryggvadóttir, Hjordis B. (2011). The relationship of compliance with a background of childhood neglect and physical and sexual abuse. *The Journal of Forensic Psychiatry & Psychology*, *22*(1), 87–98, online: https://doi.org/10.1080/14789949.2010.524707.

Gudjonsson, Gisli, Sigurdsson, Jon F., & Sigfusdottir, Inga D. (2009a). False confessions among 15- and 16-year-olds in compulsory education and the relationship with adverse life events. *The Journal of Forensic Psychiatry & Psychology*, *20*(6), 950-963.

Gudjonsson, Gisli H., Sigurdsson, Jon F., & Sigfusdottir, Inga D. (2009b). Interrogation and false confessions among adolescents in seven European countries. *Psychology, Crime & Law*, *15*(8), 711-728, online: https://doi.org/10.1080/10683160802516257.

Gutman, Jeffrey S. (2017). An Empirical Reexamination of State Statutory Compensation for the Wrongly Convicted, 82 MO. L. REV. (2017), online: https://scholarship.law.missouri.edu/mlr/vol82/iss2/7.

Guyll, Max, Madon, Stephanie, Yang, Yueran, Lannin, Daniel G., Scherr, Kyle, & Greathouse, Sarah. (2013). Innocence and resisting confession during interrogation: Effects on physiologic activity. *Law and Human Behavior*, *37*(5), 366–375, online: https://doi.org/10.1037/lhb0000044.

Habib, Mandy, & Labruna, Victor. (2011). Clinical considerations in assessing trauma and PTSD in adolescents. *Journal of Child & Adolescent Trauma*, *4*(3), 198–216, online: https://doi.org/10.1080/19361521.2011.597684.

Hartwig, Maria, & Bond, Charles F. (2014). Lie detection from multiple cues: A meta-analysis. *Applied Cognitive Psychology*, *28*(5), 661–676, online: https://doi.org/10.1002/acp.3052.

Hayes, Jasmeet P., VanElzakker, Michael B., & Shin, Lisa M. (2012). Emotion and cognition interactions in PTSD: A review of neurocognitive and neuroimaging studies. *Frontiers in Integrative Neuroscience*, *6*, online: https://doi.org/10.3389/fnint.2012.00089.

Henkel, Linda A., & Coffman, Kimberly J. (2004). Memory distortions in coerced false confessions: A source monitoring framework analysis. *Applied Cognitive Psychology*, *18*(5), 567-588, online: https://doi.org/10.1002/acp.1026.

Hinton, Devon E., & Lewis-Fernández, Roberto. (2011). The cross-cultural validity of posttraumatic stress disorder: Implications for DSM-5. *Depression and Anxiety*, *28*(9), 783–801, online: https://doi.org/10.1002/da.20753.

Holman, Dawn M., Ports, Katie A., Buchanan, Natasha, Hawkins, Nikki, Merrick Melissa T., Metzler, Marilyn, & Trivers, Katrina. (2016). The association between adverse childhood experiences and risk for cancer in adulthood: A systematic review of the literature. *Pediatrics*, *138*, S81-S91, online: https://doi.org/10.1542/peds.2015-4268L.

Horvath, Frank, Blair, J. P., & Buckley, Joseph P. (2008). The behavioural analysis interview: Clarifying the practice, theory and understanding of its use and effectiveness. *International Journal of Police Science & Management, 10*, 101-118, online: https://doi.org/10.1350/ijps.2008.10.1.101.

Illinois Public Act 99-0882 (2016), online: https://www.ilga.gov/legislation/publicacts/fulltext.asp?Name=099-0882.

Inbau, Fred E., Reid, John E., Buckley, Joseph P., & Jayne, Brian C. (2013). *Criminal interrogation and confessions* (5th ed.). Burlington, MA: Jones & Bartlett Learning.

Innocence Project (2021), online: https://www.innocenceproject.org/cases/jeff-deskovic/.

Jackson, Dylan B., Fahmy, Chantal, Vaughn, Michael G., & Testa, Alexander. (2019). Police stops among at-risk youth: Repercussions for mental health. *Journal of Adolescent Health 65*(5), 627-632, online: https://doi.org/10.1016/j.jadohealth.2019.05.027.

Jennings, Ann. (2008). Models for developing trauma-informed behavioral health systems and trauma-specific services, online: http://www.theannainstitute.org/Models%20for%20Developing%20Traums-Report%201-09-09%20_FINAL_.pdf.

Kassin, Saul. M. (2008). False confessions: Causes, consequences, and implications for reform. *Current Directions in Psychological Science*, *17*(4), 249-253, online: https://doi.org/10.1111%2Fj.1467-8721.2008.00584.x.

Kassin, Saul. M., Drizin, Steven. A., Grisso, Thomas., Gudjonsson, Gisli. H., Leo, Richard A., & Redlich, Allison D. (2010). Police-induced confessions: Risk factors and recommendations. *Law and Human Behavior, 34*(1), 3-38, online: https://doi.org/10.1007/s10979-009-9188-6.

Kassin, Saul M., Redlich, Allison D., Alceste, Fabiana, & Luke, Timothy J. (2018). On the general acceptance of confessions research: Opinions of the scientific community. *American Psychologist, 73*(1), 63–80, online: https://doi.org/10.1037/amp0000141.

Kelley, Lance P., Weathers, Frank W., McDevitt-Murphy, Meghan E., Eakin, David E., & Flood, Amanda M. (2009). A comparison of PTSD symptom patterns in three types of civilian trauma. *Journal of Traumatic Stress*, *22*(3), 227–235, online: https://doi.org/10.1002/jts.20406.

Kerig, Patricia K. (2019). Linking childhood trauma exposure to adolescent justice involvement: The concept of posttraumatic risk-seeking. *Clinical Psychology: Science and Practice*, *26*(3), e12280, online: https://doi.org/10.1111/cpsp.12280.

Kerig, Patricia K., Bennett, Diana C., Thompson, Mamie, & Becker, Steven P. (2012). "Nothing really matters": Emotional numbing as a link between trauma exposure and callousness in delinquent youth. *Journal of Traumatic Stress, 25*(3), 272–279, online: https://doi.org/10.1002/jts.21700.

Kerig, Patricia K., Charak, Ruby, Chaplo, Shannon D., Bennett, Diana C., Armour, Cherie, Modrowski, Crosby A., & McGee, Andrew B. (2016). Validation of the factor structure of the adolescent dissociative experiences scale in a sample of trauma-exposed detained

youth. *Psychological Trauma: Theory, Research, Practice, and Policy*, *8*(5), 592-600, online: https://psycnet.apa.org/doi/10.1037/tra0000140.

Kessler, Ronald C., Sonnega, Amanda, Bromet, Evelyn, Hughes, Michael, & Nelson, Christopher B. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of General Psychiatry*, *52*(12), 1048-1060, online: https://doi.org/10.1001/archpsyc.1995.03950240066012.

Kilpatrick, Dean G., Ruggiero, Kenneth J., Acierno, Ron, Saunders, Benjamin E., Resnick, Heidi S., & Best, Connie L. (2003). Violence and risk of PTSD, major depression, substance abuse/dependence, and comorbidity: Results from the National Survey of Adolescents. *Journal of Consulting and Clinical Psychology*, *71*(4), 692–700, online: https://doi.org/10.1037/0022-006X.71.4.692.

Lamb, Michael E., Orbach, Yael, Hershkowitz, Irit, Esplin, Phillip, & Horowitz, Dvora. (2007). A structured forensic interview protocol improves the quality and informativeness of investigative interviews with children: A review of research using the NICHD Investigative Interview Protocol. *Child Abuse & Neglect*, *11*, 1201-1231, online: https://doi.org/10.1016/j.chiabu.2007.03.021.

Layne, Christopher M., Greeson, Johanna K. P., Ostrowski, Sarah A., Kim, Soeun, Reading, Stephanie, Vivrette, Rebecca L., Briggs, Ernestine C., Fairbank, John A., & Pynoos, Robert S. (2014). Cumulative trauma exposure and high risk behavior in adolescence: Findings from the National Child Traumatic Stress Network Core Data Set. *Psychological Trauma: Theory, Research, Practice, and Policy*, *6*, S40–S49, online: https://doi.org/10.1037/a0037799.

Leo, Richard A. (2013). Why interrogation contamination occurs. University of San Francisco Law Research Paper No. 2013-25.

Leo, Richard A. (2008). *Police interrogation and American justice*. Boston: Harvard University Press.

Leo, Richard A., & Drizin, Steven A. (2010). The three errors: Pathways to false confession and wrongful conviction. In G. D. Lassiter & C. A. Meissner (Eds.), *Police interrogations and false confessions: Current research, practice, and policy recommendations*. American Psychological Association.

Levine, Steven Z., Laufer, Avital, Hamama-Raz, Yaira, Stein, Einat, & Solomon, Zahava. (2008). Posttraumatic growth in adolescence: Examining its components and relationship with PTSD. *Journal of Traumatic Stress*, *21*(5), 492–496, online: https://doi.org/10.1002/jts.20361.

Luthra, Rohini, Abramovitz, Robert, Greenberg, Rick, Schoor, Alan, Newcorn, Jeffrey, Schmeidler, James, ... & Chemtob, Claude M. (2009). Relationship between type of trauma exposure and posttraumatic stress disorder among urban children and adolescents. *Journal of Interpersonal Violence*, *24*(11), 1919-1927, online: https://doi.org/10.1177%2F0886260508325494.

MacDonald, Helen Z., Vasterling, Jennifer J., & Rasmusson, Ann. (2011). Neuropsychological underpinnings of PTSD in children and adolescents. In M. J. Friedman, T. M. Keane, & P. A. Resick (Eds.). *Post-traumatic syndromes in childhood and adolescence: A handbook of research and practice* (2nd ed., pp. 113–133). Wiley Blackwell.

Madon, Stephanie, Guyll, Max, Scherr, Kyle C., Greathouse, Sarah, & Wells, Gary L. (2012). Temporal discounting: The differential effect of proximal and distal consequences on confession decisions. *Law and Human Behavior, 36*(1), 13-20, online: https://doi.org/10.1037/h0093962.

Marsac, Megan L., Kassam-Adams, Nancy, Hildenbrand, Aimee K., Nicholls, Elizabeth, …. Fein, Joel. (2016). Implementing a trauma-informed approach in pediatric health care networks. *JAMA Pediatrics, 170*(1), 70-77, online: https://doi.org/10.1001/jamapediatrics.2015.2206.

McDonnell, Christine G., Boan, Andrea D., Bradley, Catherine C., Seay, Kristin D., Charles, Jane M., & Carpenter, Laura A. (2019). Child maltreatment in autism spectrum disorder and intellectual disability: Results from a population-based sample. *Journal of Child Psychology and Psychiatry*, *60*(5), 576–584, online: https://doi.org/10.1111/jcpp.12993.

McLaughlin, Katie A., Sheridan, Margaret A., & Lambert, Hilary K. (2014). Childhood adversity and neural development: Deprivation and threat as distinct dimensions of early experience. *Neuroscience & Biobehavioral Reviews*, *47*, 578–591, online: https://doi.org/10.1016/j.neubiorev.2014.10.012.

Meyer, Jessica R., & Reppucci, N. D. (2007). Police practices and perceptions regarding juvenile interrogation and interrogative suggestibility. *Behavioral Sciences & the Law*, *25*, 757–780, online: https://doi.org/10.1002/bsl.774.

Michalopoulos, Lynn M., Meinhart, Melissa, Yung, Justina, Barton, Samuel M., Wang, Xinyi, Chakrabarti, Urmi, Ritchey, Megan, Haroz, Emily, Joseph, Nakita, Bass, Judath, & Bolton, Paul. (2020). Global posttrauma symptoms: A systematic review of qualitative literature. *Trauma, Violence, & Abuse*, *21*(2), 406–420, online: https://doi.org/10.1177/1524838018772293.

Miller, Jeanee C., Redlich, Allison D., & Kelly, Christopher E. (2018). Accusatorial and information-gathering interview and interrogation methods: A multi-country comparison. *Psychology, Crime & Law*, *24*(9), 935–956, online: https://doi.org/10.1080/1068316X.2018.1467909.

Mindthoff, Amelia, Evans, Jacqueline R., Perez, Giselle, Woestehoff, Skye A., Olaguez, Alma P., Klemfuss, Joe Z., Normile, Christopher J., Scherr, Kyle C., Carlucci, Marianna E., Carol, Rolando N., Meissner, Christopher A., Michael, Steven W., Russano, Melissa B., Stocks, Eric L., Vallano, Jonathan P., & Woody, William D. (2018). A survey of potential jurors' perceptions of interrogations and confessions. *Psychology, Public Policy, and Law, 24*(4), 430–448, online: https://doi.org/10.1037/law0000182.

Monahan, Kathryn, Steinberg, Lawrence, Cauffman, Elizabeth, & Mulvey, Edward. (2013). Psychosocial (im)maturity from adolescence to early adulthood: Distinguishing between adolescence-limited and persisting antisocial behavior. *Development and Psychopathology, 25*(4pt1), 1093-1105, online: https://doi.org/10.1017/s0954579413000394.

Muncie, John, & Goldson, Barry. (2006). *Comparative Youth Justice*. SAGE.

Nader, Kathleen, & Weems, Carl F. (2011). Understanding and assessing cortisol levels in children and adolescents. *Journal of Child & Adolescent Trauma*, *4*(4), 318–338, online: https://doi.org/10.1080/19361521.2011.624059.

National Academies of Sciences, Engineering, and Medicine. (2019). *The Promise of Adolescence: Realizing Opportunity for All Youth*. Washington, DC: The National Academies Press, online: https://doi.org/10.17226/25388.

Noll, Jennie G., & Grych, John H. (2011). Read-react-respond: An integrative model for understanding sexual revictimization. *Psychology of Violence*, *1*, 202, online: https://doi.org/10.1037/a0023962.

Owen-Kostelnik, Jessica, Reppucci, N. D., & Meyer, Jessica R. (2006). Testimony and interrogation of minors: Assumptions about maturity and morality. *American Psychologist, 61*(4), 286-304, online: http://dx.doi.org/10.1037/0003-066X.61.4.286.

Perillo, Jennifer T., & Kassin, Saul M. (2011). Inside interrogation: The lie, the bluff, and false confessions. *Law and Human Behavior, 35*(4), 327–337, online: https://doi.org/10.1007/s10979-010-9244-2.

Pineles, Suzanne L., Suvak, Michael K., Liverant, Gabrielle I., Gregor, Kristin, Wisco, Blaire E., Pitman, Roger K., & Orr, Scott P. (2013). Psychophysiologic reactivity, subjective distress, and their associations with PTSD diagnosis. *Journal of Abnormal Psychology*, *122*(3), 635–644, online: https://doi.org/10.1037/a0033942.

Pole, Nnamdi. (2007). The psychophysiology of posttraumatic stress disorder: A meta-analysis. *Psychological Bulletin*, *133*(5), 725–746, online: https://doi.org/10.1037/0033-2909.133.5.725

Pollak, Seth D., & Sinha, Pawan. (2002). Effects of early experience on children's recognition of facial displays of emotion. *Developmental Psychology*, *38*(5), 784–791, online: https://doi.org/10.1037/0012-1649.38.5.784.

Puzzanchera, Charles. (2021). Juvenile arrests, 2019. U.S. Department of Justice: Office of Justice Programs. Available at https://ojjdp.ojp.gov/publications/juvenile-arrests-2019.pdf.

Pynoos, Robert S., Steinberg, Alan M., Layne, Christopher M., Briggs, Ernestine C., Ostrowski, Sarah A., & Fairbank, John A. (2009). DSM-V PTSD diagnostic criteria for children and adolescents: A developmental perspective and recommendations. *Journal of Traumatic Stress*, *22*(5), 391–398, online: https://doi.org/10.1002/jts.20450.

Rasmussen, Andrew, Keatley, Eva, & Joscelyne, Amy. (2014). Posttraumatic stress in emergency settings outside North America and Europe: a review of the emic literature. *Social Science & Medicine*, *109*, 44-54, online: https://doi.org/10.1016/j.socscimed.2014.03.015.

Schatz, Samson J. (2018). Interrogated with intellectual disabilities: The risk of false confession. *Stanford Law Review, 70*, 643-690.

Schneckloth v. Bustamonte, 412 U.S. 218 (1973).

Schweizer, Susanne, & Dalgleish, Tim. (2011). Emotional working memory capacity in posttraumatic stress disorder (PTSD). *Behaviour Research and Therapy*, *49*(8), 498–504, online: https://doi.org/10.1016/j.brat.2011.05.007.

Sigurdsson, Jon F., & Gudjonsson, Gisli H. (1996). The psychological characteristics of 'false confessors': A study among Icelandic prison inmates and juvenile offenders. *Personality and Individual Differences*, *20*(3), 321–329, online: https://doi.org/10.1016/0191-8869(95)00184-0.

Snook, Brent, Eastwood, Joseph, & Barron, Todd. (2014). The next stage in the evolution of interrogations: The PEACE model. *Canadian Criminal Law Review*, *18*(2), 219-239.

Steinberg, Lawrence. (2017). Adolescent brain science and juvenile justice policymaking. *Psychology, Public Policy, and Law*, *23*(4), 410–420, online: https://doi.org/10.1037/law0000128.

Stoffel, Elizabeth, Korthase, Adrea, & Gueller, Melissa. (2019). Assessing trauma for juvenile and family court judges: From development to implementation, 2013-2017, online: https://www.ncjfcj.org/publications/assessing-trauma-for-juvenile-and-family-court-judges-from-development-to-implementation-2013-2017/.

Sugie, Naomi F., & Turney, Kristin. (2017). Beyond incarceration: Criminal justice contact and mental health. *American Sociological Review*, *82*(4), 719-743, online: https://doi.org/10.1177%2F0003122417713188.

Thompson, Kristen L., Hannan, Susan M., & Miron, Lynsey R. (2014). Fight, flight, and freeze: Threat sensitivity and emotion dysregulation in survivors of chronic childhood maltreatment. *Personality and Individual Differences*, *69*, 28-32, online: https://doi.org/10.1016/j.paid.2014.05.005.

Van der Kolk, Bessel A. (2006). Clinical implications of neuroscience research in PTSD. *Annals of the New York Academy of Sciences*, *1071*(1), 277–293, online: https://doi.org/10.1196/annals.1364.022.

Volchan, Eliane, Rocha-Rego, Vanessa, Bastos, Aline F., Oliveira, Jose M., Souza, Gabriela, Oliveria, Leticia, David, Isabel, Erthal, Fatima, Pereira, Mirtes, & Figueria, Ivan. (2017). Immobility reactions under threat: A contribution to human defensive cascade and PTSD. *Neuroscience & Biobehavioral Reviews*, *76*, 29–38, online: https://doi.org/10.1016/j.neubiorev.2017.01.025.

Walsh, Kate, Danielson, Carla K., McCauley, Jenna, Hanson, Rochelle F., Smith, Daniel W., Resnick, Heidi S., ... Kilpatrick, Dean G. (2012). Longitudinal trajectories of posttraumatic stress disorder symptoms and binge drinking among adolescent girls: the role of sexual victimization. *Journal of Adolescent Health*, *50*(1), 54-59, online: https://doi.org/10.1016/j.jadohealth.2011.05.017.

Walters, Stan B. (2019). *Principles of kinesic interview and interrogation* (2nd ed.). Boca Raton, FL: CRC press.

Welfare, Heather, & Hollin, Clive R. (2012). Involvement in extreme violence and violence-related trauma: A review with relevance to young people in custody. *Legal and Criminological Psychology*, *17*(1), 89-104, online: https://doi.org/10.1111/j.2044-8333.2010.02002.x.

Whitfield, Charles L., Anda, Robert F., Dube, Shanta R., & Felitti, Vincent J. (2003). Violent childhood experiences and the risk of intimate partner violence in adults: assessment in a large health maintenance organization. *Journal of Interpersonal Violence, 18*, 166–185, online: https://doi.org/10.1177/0886260502238733.

Wood, Jennifer, Foy, David W., Goguen, Carol A., Pynoos, Robert, & James, C. B. (2002). Violence exposure and PTSD among delinquent girls. *Journal of Aggression, Maltreatment & Trauma*, *6*(1), 109-126, online: https://doi.org/10.1300/J146v06n01_06.

Zatzick, Douglas F., Grossman, David C., Russo, Joan, Pynoos, Robert, Berliner, Lucy, Jurkovich, Gregory, ... & Rivara, Frederick P. (2006). Predicting posttraumatic stress symptoms longitudinally in a representative sample of hospitalized injured adolescents. *Journal of the American Academy of Child & Adolescent Psychiatry*, *45*(10), 1188-1195, online: https://doi.org/10.1097/01.chi.0000231975.21096.45.

Zhu, Wenfeng, Chen, Yunli, & Xia, Ling-Xiang (2020). Childhood maltreatment and aggression: The mediating roles of hostile attribution bias and anger rumination. *Personality and Individual Differences*, *162*, 110007, online: https://doi.org/10.1016/j.paid.2020.110007.