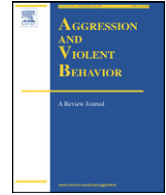




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Aggression and Violent Behavior



A conceptual model of the relationship between maltreatment and externalizing, antisocial, and criminal behavior problems, and the intervening role of child welfare service delivery



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ABSTRACT

Despite a substantial body of research examining the relationship between child maltreatment and externalizing, antisocial, and criminal behavior problems, theory is rarely applied in the current empirical research literature. The lack of theoretical application limits opportunities to understand the mechanisms explaining why maltreatment is associated with behavior problems, and the best strategies for intervening to interrupt this association. The purpose of this paper is to analyze relevant theoretical perspectives and develop a conceptual model explaining the relationship between maltreatment and behavior problems, and the intervening role of child welfare services. Six theoretical perspectives were selected for analysis: the ecological model, the transactional model, attachment theory, the life course perspective, the social learning perspective, and social–biological models. After applying these theories to understanding the maltreatment–behavior problem association and the role of child welfare services in intervening, insights from these theories were synthesized into a conceptual model. The policy and practice implications of this model are discussed, with a focus on the implications for child welfare workers, administrators, and policymakers.

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1. Introduction

Child abuse and neglect is a serious childhood adversity associated with significant social and economic costs and a range of consequences for children and youth, including depression and other internalizing issues and disruptions to cognitive and emotional development

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(Cicchetti & Toth, 2005). It is well established that maltreatment is associated with behavior problems, such as externalizing, antisocial, and delinquent or criminal behavior (e.g., Burnette, Oshri, Lax, Richards, & Ragbeer, 2012; Cecil, Viding, Barker, Guiney, & McCrory, 2014; Ryan, Williams, & Courtney, 2013). Almost thirty years ago, Garbarino and Plantz (1986) underscored the difficulty involved in understanding the magnitude, direction, and significance of this association, an observation that remains true. Behavior problems may play a causal role in eliciting maltreatment or may be a consequence of abuse or neglect, a bidirectional relationship may exist, or alternatively, maltreatment and behavior problems may have common causes. Complex contextual mechanisms likely explain why maltreatment and behavior problems are associated for some young people, but not others. The difficulty in understanding these complex issues demands attention to a spectrum of diverse theoretical perspectives that can explain the relationship between child abuse and neglect and externalizing, antisocial, and criminal behaviors. A comprehensive analysis and integration of theories will illuminate the mechanisms linking maltreatment with behavior problems and will provide insight into the question of which maltreated children are at greatest risk.

Child welfare services represent a key service system for children and youth who experience maltreatment, a population at significant risk of behavioral difficulties. Indeed, it is estimated that between 20 and 50% of the populations served by child welfare systems struggle with clinically significant behavior problems such as aggression and criminality (see Campbell, Thomas, Cook, & Keenan, 2013; Ellenbogen, Trocmé, & Wekerle, 2013; Keil & Price, 2006; Postlethwait, Barth, & Guo, 2010). Child welfare services are in a position to play a crucial role in preventing behavior problems among maltreated children, as well as intervening to facilitate service delivery for children who exhibit behavioral difficulties. It is unclear, however, how child welfare systems can best meet the needs of the vulnerable young people who have experienced maltreatment and demonstrate externalizing, antisocial, or criminal behaviors. Analyzing and integrating theoretical knowledge will offer insight into the specific elements of child welfare services that promote positive outcomes, and the factors that constrain effective service delivery.

While the empirical literature offers some understanding of why maltreatment is associated with behavior problems and how child welfare service providers can best support maltreated children with these problems, this paper contributes to the scant body of work that applies theories to these questions. After a comprehensive review of relevant literature, six theoretical perspectives were selected for further analysis: the ecological model, the transactional model, attachment theory, the life course perspective, the social learning perspective, and social-biological models. The purpose of this paper is to analyze and integrate these theoretical perspectives into a conceptual model that further explains (1) why child maltreatment is associated with behavior problems, and (2) how child welfare services can prevent and alleviate behavioral difficulties among children who have experienced abuse or neglect. Informed by theories from across various disciplines, the theoretical analysis and integration presented in this paper is intended to assist researchers, practitioners, and policy makers in developing effective interventions and directing those interventions toward the most vulnerable children and youth.

2. Analysis of theoretical perspectives

2.1. Ecological model

Ecological models represent an evolving body of theory and research focused on the environmental processes that impact human development across the life course (Bronfenbrenner, 1994). Originally developed by Bronfenbrenner in the 1970s (1974, 1977, 1979), a central tenet of the ecological model is that physical, social, and emotional development is impacted by the interactions between individual

characteristics and the environment, including the family, peer, school, and community contexts (Jenson & Fraser, 2006; Scannapieco & Connell-Carrick, 2005). According to Bronfenbrenner (1994), human development occurs through a process of progressively complex reciprocal interactions between an active, evolving, bio-psychological human, and the individuals, objects, and symbols in her or his immediate environment. The enduring interactions that occur over extended periods of time are considered proximal processes, and include, for example, parent-child activities, solitary play or play with peers, reading, learning new skills, and performing complex tasks. These processes occur within an ecological environment, which is conceptualized as a set of nested structures, with the innermost level defined as the *microsystem* (e.g., family, school, peer group) and the outermost level defined as the *macrosystem* (e.g., culture, belief systems, opportunity structures, life course options) (Bronfenbrenner, 1994). The *chronosystem* adds a temporal dimension to the ecological model, representing change or consistency over time in the characteristics of the individual and her or his environment.

Applying the ecological model to the understanding of child maltreatment, Belsky (1980) proposed that the causes of maltreatment are ecologically nested. While the *microsystem* is viewed as the immediate context in which maltreatment occurs, Belsky emphasized the importance of interactions among various levels of the ecological system. Characteristics of the caregiver, such as lack of experience with parenting, or history of maltreatment in her or his own childhood, can interact with other factors at the outer levels of the ecological system (e.g., parental unemployment, social isolation, community violence) as well as situational factors (e.g., parent-child argument, family crisis, bereavement or loss) to cause maltreatment. Belsky (1993) concluded that there is no single cause of maltreatment, and that there are no necessary or sufficient causes of maltreatment. Rather, there are multiple pathways to abuse and neglect, which tend to lead in the direction of maltreatment when risk factors outweigh protective factors.

In the study of externalizing, antisocial, and criminal behaviors, the ecological model is often utilized as a means to identify predictors or risk factors at various levels of a child's ecology (e.g., Dishion, Capaldi, & Yoerger, 1999; Gorman-Smith, Tolan, & Henry, 2000; Suldo, Mihalas, Powell, & French, 2008). According to the ecological model, behavioral development and expression are influenced by a person's interactions with the environment, including both the immediate physical and social settings and the relationships among settings (White & Renk, 2012). It is expected that specific environmental elements will heighten or diminish the risk of psychopathology over time, including the risk of problem behaviors in childhood and adolescence (Szapocznik & Coatsworth, 1999), and further, that contextual factors can have direct, mediated, and moderated effects on outcomes (Lochman, 2004). Such contextual factors include family and peer relationships, school characteristics, or a social service intervention, all of which can alter the link between a risk factor and a later behavioral outcome (Lochman, 2004; Osher et al., 2004).

The ecological model offers important insight into why maltreatment is associated with behavior problems. In line with this model, it is expected that the extent to which maltreated children develop behavior problems will vary significantly, depending on their ability to cope with their maltreatment and the availability of support in the environment, from peers, family, community, school, and social services (Tabone et al., 2011). As protective factors diminish and risk factors accumulate at various ecological levels in the life of a maltreated child, behavior problems become more likely to develop and persist (MacKenzie, Kotch, Lee, Augsberger, & Hutto, 2011; Tabone et al., 2011; Verrecchia, Fetzer, Lemmon, & Austin, 2010). Maltreatment can add to an already accumulating number of risks in a child's social ecology, playing a causal role in the development of externalizing, antisocial, and criminal behavior problems. At the same time, difficult child behavior can be understood as an individual characteristic that increases the risk of maltreatment.

The ecological model also provides insight into how child welfare service providers can intervene to promote positive behavioral outcomes among maltreated children. According to this model, social policies and programs will be particularly effective when aimed at enhancing exposure to proximal processes, or in other words, those enduring interactions that occur over extended periods of time and contribute to healthy growth and development (e.g., positive parent-child interactions) (Bronfenbrenner, 1994). In line with a focus on proximal processes, child welfare service providers could support positive behavioral outcomes by focusing on enhancing these processes at the family level. Further, the ecological model points to a wide range of strategies for intervening to address maltreatment and children's behavior problems, with the assumption that services are most effective when multiple levels of the ecological system are targeted, including the family, peer group, school, and community (Jenson & Fraser, 2006; Wiehe, 1989).

It is important to recognize that child welfare service providers also operate in an ecological context that can enhance or constrain their ability to impact proximal processes and target multiple levels of the ecological system. This concept is central to the Decision-Making Ecology, a theoretical perspective that explores the influence of the ecological context on child welfare practice (Baumann, Kern, & Fluke, 1997). Various factors are hypothesized to influence the ability of child welfare service providers to deliver effective services. Such factors include characteristics of child welfare workers (e.g., worker training, experience), child welfare agencies (e.g., management structure of child welfare agency), and the larger policy and legal context (Baumann, Dalglish, Fluke, & Kern, 2011). Understanding how child welfare service providers can intervene to promote positive behavioral outcomes among maltreated children, therefore, demands attention to the ecological context in which child welfare workers operate.

With compelling evidence to support the ecological model, it is widely applied in studies across various disciplines (e.g., Cicchetti & Lynch, 1993; Dishion et al., 1999; Gorman-Smith et al., 2000; Jonson-Reid, 1998; Osher et al., 2004; Scannapieco & Connell-Carrick, 2005; Suldo et al., 2008; White & Renk, 2012). Evidence from these and other studies indicates that maltreatment is associated with externalizing, antisocial, and criminal behavior problems in the context of multiple ecological risks (e.g., MacKenzie et al., 2011; Tabone et al., 2011; Verrecchia et al., 2010). Although the comprehensive nature of the ecological model is a key strength, it is challenging to truly test its assumptions. Empirical measurement of every level of ecological analysis is beyond the scope of any single research effort (Belsky, 1980). Even so, theoretical insights based on the ecological model allow for a deeper understanding of why maltreatment is related to behavior problems, and how to best integrate knowledge from various levels of ecological analysis to inform interventions.

2.2. Transactional model

The transactional approach to understanding maltreatment emerged in the work of Sameroff and Chandler (1975), Belsky (1984), and Bugental, Mantayla, and Lewis (1989). Sameroff and Chandler posed two key questions (Sameroff, 2009): Why do the vast majority of infants with medical anomalies grow up to *not* have the expected cognitive and emotional difficulties? And, why do many parents with personality traits associated with maltreatment *not* abuse or neglect their children? For Sameroff and Chandler, the answer to these questions was found in *transactions*. These authors proposed that there are constant transactions among child characteristics, parental traits, and environmental factors, resulting in a dynamic and reciprocal process contributing to child development (Sameroff & Chandler, 1975). The transactional model is naturally complementary to the ecological model (MacKenzie et al., 2011), particularly in its attention to the influence of the accumulation of risk factors at various ecological levels on

developmental trajectories (Sameroff, Bartko, Baldwin, Baldwin, & Seifer, 1998).

Transactional models offer useful insight into the relationship between maltreatment and behavior problems. According to Bugental et al. (1989), difficult behaviors in children can interact with parents' self-perceived and actual power, invoking harsh and inconsistent responses toward children. Those parents who believe they have little power over children are expected to be more reactive in potentially threatening interpersonal interactions, and to display negative affect and inconsistent messages to children, which maintains or exacerbates difficult child behaviors (Bugental et al., 1989). For instance, if a child refuses to comply with a parental demand, and the parent withdraws the demand to reduce the child's negative behaviors, such behavior is rewarded and is likely to persist, while the parent may escalate attempts to gain control by utilizing increasingly harsh parenting techniques, such as physically or psychologically controlling behaviors (Stringer & La Greca, 1985). Bugental (2009) later proposed a bio-cognitive transactional model of child maltreatment, proposing that adults with easily activated physiological threat response systems are more likely to display harsh parenting when interacting with children demonstrating difficult behaviors. Patterson (1982) also proposed a model of coercive parent-child interactions, predicting that children with difficult behaviors elicit a harsh and coercive response from parents, particularly those who lack effective child management skills or who display irritable and explosive behavior (also see Simons, Simons, & Wallace, 2004; Stringer & La Greca, 1985; Tzeng, Jackson, & Karlson, 1991).

A solid empirical evidence base supports the central tenets of transactional models (e.g., Bugental, Blue, & Lewis, 1990; Caspi et al., 2004; De Haan, Prinzie, & Dekovic, 2012; Gromoske & Maguire-Jack, 2012; Zadeh, Jenkins, & Pepler, 2010). Overall, transactional models are flexible and allow for the incorporation of ideas drawn from a variety of theoretical perspectives along with consideration of a wide range of variables operative within families (Bugental, 2009). These models can promote understanding of why maltreatment is associated with externalizing, antisocial, and criminal behavior problems, and can also inform child welfare practice. Informed by transactional principles, child welfare service providers could intervene to help parents develop skills and capacities for consistently managing difficult child behavior without harsh parenting practices, while promoting parental feelings of empowerment and self-efficacy.

2.3. Attachment theory

A tremendously large body of literature has amassed over the past several decades in support of attachment theory (e.g., Baer & Martinez, 2006; Crittenden, 2000; Egeland & Sroufe, 1981; Fearon, Bakermans-Kranenburg, van Ijzendoorn, Lapsley, & Roisman, 2010; Lowell, Renk, & Adgate, 2014; Tucker & MacKenzie, 2012). According to this theory, human survival is dependent on the proximity of attachment figures, which is accomplished through infant attachment to the parent, parent caregiving to the infant, and complementary maternal and infant patterns of behavior (Crittenden & Ainsworth, 1989). Crittenden and Ainsworth (1989) note that attachment is usually achieved in the first year of life. By age three, the child no longer depends on the actual presence of the attachment figure for a sense of security, but rather the child feels secure because of the mutual trust and understanding that has developed with the caregiver. As children grow older, attachments can be maintained without physical proximity for increasingly long periods of time, and in adolescence, young people begin to search for new attachments outside of the family. Later, stable and affectionate relationships are usually desired in adulthood. Attachment relationships are important to individual functioning at all stages of life, with the specific nature of attachments varying with developmental stages (Crittenden & Ainsworth, 1989).

Ainsworth, Blehar, Waters, and Wall (1978) conceptualized three major patterns of attachment in infancy, including secure, anxious/

ambivalent, and anxious/avoidant or anxious/resistant. *Securely attached* infants are those with sensitive and responsive caregivers. These infants display positive affect and cry very little, and are easily reassured and comforted when attachment behavior is activated. Caregivers that are inaccessible, unresponsive, or inappropriately responsive are more likely to have infants with anxious attachment. For infants with *anxious/ambivalent attachment*, efforts at gaining proximity to the attachment figure are often met with frustration. When the caregiver does eventually respond, the infant is ambivalent and difficult to soothe. This leads to a pattern in which the infant is distressed at any sign of separation. Infants with *anxious/avoidant* or *anxious/resistant attachment* behave similarly in response to inaccessible and rejecting caregivers, although in high stress situations, they tend to display little stress upon separation and avoidance of the caregiver upon reunion. Since Ainsworth et al. (1978) initially proposed this classification system, there have been numerous attempts at expanding and revising it (Crittenden & Ainsworth, 1989). The most notable addition to this classification scheme is *disorganized/disoriented attachment*, a pattern characterized by the absence of an organized strategy for coping with stress (Main & Hesse, 1990; Main & Solomon, 1986).

Proponents of attachment theory persuasively argue that the quality of the early attachment relationship has an enduring influence throughout the life course, a proposition that is well supported by research evidence (Fearon et al., 2010; Gauthier, Fortin, & Jeliu, 2004; Limke, Showers, & Zeigler-Hill, 2010; Lowell et al., 2014; Vondra & Toth, 1989). Early attachments produce a cognitive model of relationships and the self, influencing perceptions of self-worth as well as expectation of others (Crittenden, 1985). In this way, early attachments influence an infant's development of internal representational models, or in other words, expectations regarding the nature of future relationships (Ainsworth, 1979; Bowlby, 1969). Infants who experience unresponsive or inappropriate caregiving are more likely to form a representational model that leads them to believe that they are unworthy of the caregiver's love and care, and that they cannot trust the caregiver (Crittenden & Ainsworth, 1989). Although these models are initially developed from early experiences with caregivers, they are dynamic and modifiable as individuals grow and have further experiences with attachment figures (Crittenden, 1985, 2000). Early experiences with caregivers, therefore, play a critical but not deterministic role in human development, including in the development of psychopathology (Sroufe, Carlson, Levy, & Egeland, 1999).

Attachment has been identified as a potential mechanism that explains the relationship between maltreatment and externalizing, antisocial, and criminal behaviors (e.g., Feerick, Haugaard, & Hien, 2002; Sousa et al., 2011). According to attachment theory, experiences of early abuse and neglect have dramatic and specific consequences on the quality of early attachment patterns (Egeland & Sroufe, 1981). Bowlby (1944, 1973) proposed that negative consequences of disruptions in early relationships with caregivers include an inability to show concern for others as well as aggressive and delinquent behavior. In Bowlby's (1944) early study of delinquents, he noted that most of these troubled young people had a history of repeated separations from their mothers in early infancy, which led to a loss of trust in the attachment figure and subsequent severe behavioral disturbances. Several criminological theories, including social control theory (Hirschi, 1969) and the social development model (Catalano et al., 2005), also point to the role of attachments and bonds in preventing criminal behavior, specifically positive attachments to prosocial family members, peers, and others. Thus, in line with these theories, maltreatment is prone to disrupting attachment relationships, thus contributing to the development of behavior problems.

Attachment theory is highly relevant when understanding the critical influence of child welfare services on behavioral outcomes of maltreated children and youth. Child welfare service providers are in a position to work toward the prevention and alleviation of behavior problems among maltreated children by supporting secure attachments early in life, helping to repair disruptions in attachment relationships,

and facilitating access to therapeutic resources for young people with attachment disturbances. Attachment theory is also helpful in informing out-of-home child welfare placement interventions. Placement in out-of-home care is typically the last resort service in child welfare, but is considered necessary in certain highly pathological situations (Gauthier et al., 2004). Children in out-of-home placements are at high risk for disordered attachment, and reciprocally, attachment disturbances create barriers to establishing permanent homes and stable emotional ties for these children (Gauthier et al., 2004; Tucker & MacKenzie, 2012). A perspective informed by attachment theory considers positive attachment relationships and placement stability crucial in preventing and alleviating behavior problems among maltreated children living at home and in out-of-home placements.

2.4. Life course perspective

Life course perspectives focus on the development of antisocial and criminal behavior, concentrating on risk and protective factors across different ages, and the impact of life events on development (Farrington, 2005). According to John Laub and Robert Sampson's life course theory (1993), children who have high quality bonds to caring family members and to positive school environments are less likely to engage in delinquent behavior. While childhood experiences are considered critical in the development of criminal behavior, these experiences are not expected to solely determine behavioral outcomes in later life. Rather, both continuity and change are expected in antisocial and criminal behaviors across the life course, depending on the strength and quality of attachments with family and institutions such as school and work. Laub and Sampson discuss three related concepts that illustrate the continuity and change in these behaviors over time: trajectories or pathways over the life span, transitions or life events that are embedded in trajectories, and turning points or points that generate a change in the life course. Laub and Sampson propose that significant life events and social bonds in adulthood can mitigate the trajectories of early childhood, and that turning points can change trajectories and redirect life paths over time (2001).

While Laub and Sampson emphasize that risk factors in childhood do not necessarily lead to negative outcomes in adulthood, these scholars do not ignore the possibility that early delinquency leads to accumulating disadvantage, which in turn limits opportunities for conventional development. They incorporate Moffitt's (1993) concept of cumulative continuity into their theory, defined as the process through which delinquency incrementally damages the future by breaking bonds to individuals and societal institutions, creating negative consequences and generating stigma (Laub & Sampson, 1993). In this way, Laub and Sampson also incorporate aspects of labeling theory into their life course perspective, arguing that young people who engage in deviant behavior are labeled and stigmatized from an early age, which is part of the process of cumulative continuity (see Hoffmann, 2011; Matsueda & Heimer, 2001). Cumulative continuity is viewed as being most detrimental for young people in marginalized social locations. Young people in advantaged societal positions typically receive a continuity of social resources that allow them to establish ties to conventional adulthood, regardless of delinquent behavior. In contrast, young people in marginalized social positions due to race or class have fewer social resources and in turn are more vulnerable to cumulative continuity (Laub & Sampson, 1993).

Other scholars have developed theories in line with the life course perspective to understand the development of delinquent or criminal behaviors in adolescence and adulthood. According to Thornberry's interactional theory (1987), adolescents are not propelled along a unidirectional pathway to any outcome, but rather adolescents relate to people and institutions within an interactive system, and it is these interactions that shape behavioral outcomes. When social bonds are weak, a much broader array of behavior is expected, including unconventional actions such as academic failure, substance use, and

delinquency. In turn, these unconventional actions further weaken bonds to conventional society. Thornberry and Krohn (2005) expanded these theoretical propositions, arguing that antisocial child behavior provokes coercive responses from parents and rejection by peers, which in turn increases the likelihood that such behavior will continue. In a child's early years, several factors are considered important to the onset of antisocial behavior, including neuropsychological deficits, temperamental difficulties, parental monitoring and discipline, and structural adversity.

Variations of the life course perspective have been used to understand the consequences of maltreatment over the life span (e.g., Williams, 2003). While several researchers have applied the life course perspective to understanding the maltreatment–behavior problem link (e.g., Burnette, 2013; Ireland, Smith, & Thornberry, 2002; Minh et al., 2013; Stewart, Livingston, & Dennison, 2008; Thompson & Tabone, 2010), few have focused on advancing this perspective to fully incorporate child abuse and neglect and child welfare service provision. This broad theoretical perspective, however, allows for the generation of hypotheses regarding the relationship between child maltreatment and externalizing, antisocial, and criminal behavior problems, as well as the intervening role of child welfare service delivery. A key strength of the life course perspective is its empirical support (e.g., Allwood & Widom, 2013; Sampson & Laub, 1994, 2005).

2.5. Social learning perspective

Social learning perspectives focus on the reciprocal and mutual influences that exist between children and others in their surroundings, including caregivers, family friends, peers, and neighbors (Simons et al., 2004). Bandura (1971), an early social learning theorist, noted that humans possess the capacity to learn by both experience and observation, which enables the acquisition of large, integrated units of behavior, as well as emotional responses to specific experiences. Bandura (1971) noted that observing others who engage in specific actions with little consequence will increase the likelihood of this behavior in the observer, whereas witnessing certain actions being punished will inhibit such behaviors. In later work, Bandura (1973, 1978) applied social learning principles to understanding the development and maintenance of aggressive behavior. He contended that while some elementary forms of aggression can be performed with little guidance, most aggressive activities require extensive learning.

Since the work of Bandura, other scholars have applied social learning principles to understanding externalizing, antisocial, and criminal behaviors. According to Snyder, Reid, and Patterson (2003), while social relationships provide opportunities for recurring learning of both prosocial and antisocial behaviors, the social contingencies and experiences that support antisocial behavior often simultaneously impede the acquisition of other important developmental capacities, including the capacity to self-regulate, problem solve, comply with requests, and effectively relate to others. Importantly, Snyder et al. (2003) highlight the relevance of the social learning perspective to understanding the well-established gender difference in externalizing, antisocial, and criminal behavior problems. According to these scholars, caregivers and peers more frequently reinforce positive social behaviors in females, rather than males, which operates to inhibit externalizing and antisocial behaviors among developing girls. Likewise, Côté (2009) points out that over the course of development, boys and girls experience distinct and specific types of reinforcement for their overtly aggressive behaviors, which likely modifies behavioral development in gender-specific ways (Côté, 2009).

Social learning perspectives have been utilized to explain why maltreatment is associated with externalizing, antisocial, and criminal behavior problems. According to social learning principles, young people who have aggressive models, such as family members or peers, learn that aggression is an option, and also learn how and when to be aggressive (Tzeng et al., 1991). Certain parenting practices, such as harsh and

inconsistent discipline, or the use of physical or psychological control, model for children how to be aggressive and antisocial (Aalsma, Liu, & Wiehe, 2011; Hoffmann, 2011). According to this perspective, violence is transmitted through generations because young people tend to embody the same relational patterns that their early caregivers displayed (Herrenkohl, Huang, Tajima, & Whitney, 2003).

The social learning perspective has significant implications for child welfare intervention. Assuming that both prosocial and antisocial behaviors can be acquired based on social learning, child welfare services can help families by utilizing learning principles to enhance prosocial capacities in both parents and children. An important role of child welfare service providers can be to assist parents in learning how to consistently reinforce prosocial behavior in their children, and how to establish appropriate consequences for antisocial behavior. While these strategies cannot address all of the complex issues that contribute to maltreatment and behavior problems, interventions based on learning principles can be incorporated into a more comprehensive and effective approach to addressing family vulnerabilities.

2.6. Social–biological models

Social–biological models focus on incorporating knowledge of biological and social processes in order to understand and explain specific human behaviors, mental and physical health issues, developmental outcomes, and other phenomena. Consistent with the person–environment approach, social–biological models offer useful insight into the impact of abuse and neglect, the causes of externalizing, antisocial, and criminal behaviors, and the possible mechanisms explaining the association between maltreatment and behavior problems. These models highlight that, like other disadvantages in the environment, child abuse and neglect can disrupt the development of essential biological processes and brain functions, areas of development that are critical for achieving optimal health and well-being (Cicchetti & Toth, 2005). In line with a social–biological perspective, environments in which child maltreatment occurs are considered a poor match for the human genotype and are therefore outside the normal range of environments expected by the human species (Twardosz & Lutzker, 2010). Given this poor match, exposure to events such as maltreatment is expected to negatively impact the development of neurotransmitter systems, neuroendocrine systems, and the immune system (De Bellis, 2005).

The negative consequences of maltreatment are considered to have particularly serious implications for the development of physiological stress response systems, which can impact children's temperaments and their abilities to regulate emotions and behaviors (Burnette et al., 2012). For instance, the hypothalamic–pituitary–adrenal (HPA) axis has been implicated as a key physiological system that is affected by maltreatment, a system that plays a crucial role in human stress responses as well as the functioning of the brain (Cicchetti & Toth, 2005). Maltreatment has the potential to impact brain structures as well as brain functions (e.g., Bremner et al., 1997; De Bellis et al., 1999; McCrory, De Brito, & Viding, 2010; Teicher, Dumont, Vaituzis, Giedd, & Andersen, 2004), including structures in the prefrontal cortex region, an area implicated in the regulation of emotions (van Harmelen et al., 2010). In contrast to environments in which maltreatment occurs, the presence of adult nurturance and protection is thought to contribute to the species–expectable environment for humans, or in other words, the kind of environment that supports typical human development (Twardosz & Lutzker, 2010). Experiencing high-quality caregiving early in life is considered critical to human development precisely because it supports the functioning of stress and affect regulation systems which enhance an individual's capacity to cope with stressors in childhood and across the life course (Cicchetti & Lynch, 1995).

A key proposition of social–biological models is that human development occurs as a result of the interaction between biological and environmental processes. Consequently, children are expected to respond differently to similar maltreatment experiences, due to factors at the

biological and social levels (Twardosz & Lutzker, 2010). That is, it is likely that similar experiences of maltreatment will impact children in a heterogeneous fashion and thus these experiences will not necessarily cause developmental disruptions (Cicchetti & Toth, 2005). Certain children, however, may be particularly vulnerable to the effects of maltreatment due to the interaction of biological and environmental factors. Indeed, research indicates that individuals who experience child maltreatment and possess a specific less efficient version of the serotonin transmitting gene (5-HTTLPR) are at increased risk of developing depression in childhood, adolescence, and early adulthood; however, individuals who possess this less efficient polymorphism but do not experience maltreatment are not at increased risk (Cutuli, Raby, Cicchetti, Englund, & Egeand, 2013).

Gene-by-environment interactions have also been implicated in the development of behavior problems among maltreated children and youth. In a seminal study, Caspi et al. (2002) examined whether child maltreatment is most strongly related to antisocial behavior among individuals who possess a specific variant of the monoamine oxidase A gene (MAOA) that metabolizes neurotransmitters such as serotonin and dopamine. The findings suggest that the relationship between maltreatment and antisocial behavior is conditional on the MAOA genotype, such that children who experience maltreatment and possess the low MAOA activity genotype are at increased risk of antisocial behavior whereas children who possess this genotype but do not experience maltreatment are not at increased risk (Caspi et al., 2002). Interestingly, this study found that among children with the high MAOA activity genotype, maltreatment was not associated with antisocial behavior.

Biological models of criminal behavior were put forth long before researchers began considering gene-by-environment interactions. While contemporary perspectives point to several possible biological factors that may interact with characteristics of the environment to influence the development of criminal behavior, biological explanations of crime and deviance have historically focused on discovering the innate or organic differences that distinguished individuals who deviated from social norms (Beirne, 1988; Hoffmann, 2011). Such biological explanations of deviance and crime emerged in the nineteenth century and are largely regarded with skepticism and criticism, particularly because of the application of these explanations in order to persecute certain groups based on perceived innate deficiencies (e.g., the eugenics movement, Social Darwinism) (Marsh, Melville, Norris, & Walkington, 2006).

Contemporary approaches have identified several possible biological factors that may increase the likelihood of aggressive, violent, and antisocial behavior while also recognizing and accounting for the importance of the environment. Some theorists hypothesize that these behaviors are heritable, passed down to future generations through genes that impact brain structures and functions under specific environmental conditions (Raine, 2008). Applying this hypothesis to understanding the relationship between maltreatment and behavior problems, it is possible that maltreating parents have specific genetic risk factors for antisocial behavior that are inherited by their maltreated children (Thornberry & Henry, 2013). That is, the very action of abusing or neglecting a child may be considered a form of violent, antisocial, or criminal behavior, and therefore the relationship between maltreatment and behavior problems may be partially explained by the shared genetic profile of maltreating parents and their children. It is also possible that the neurodevelopmental changes associated with experiencing maltreatment represent biological risk factors that increase the likelihood of externalizing, antisocial, and criminal behavior. In other words, the biological consequences of abuse and neglect may be one and the same as the biological predictors of externalizing, antisocial, and criminal behavior. While this is a compelling proposition, advances in theory and research are needed to more fully explicate the possible biological mechanisms explaining the relationship between maltreatment and behavior problems as well as the specific environmental conditions that interact with and influence these mechanisms.

Social-biological models can potentially be applied to the child welfare context. In their review, Twardosz and Lutzker (2010) describe several interventions that explicitly incorporate knowledge of biological processes into efforts to prevent maltreatment and address its consequences. With knowledge of the social and biological processes that influence the development of externalizing, antisocial, and criminal behavior, child welfare practitioners could target resources toward intervening in families who are at greatest risk of poor developmental outcomes including child behavior problems (Hoffmann, 2011). It is also critical to consider the possibility that caregivers who maltreat their children possess biological vulnerabilities that are associated with antisocial behavior. These vulnerabilities may influence the effectiveness of interventions delivered in the child welfare context, and demand customized approaches that account for biological as well as social factors (McKinlay, van Vliet-Ruissen, & Taylor, 2014).

3. Discussion

3.1. Comparison of theoretical perspectives

Six theoretical perspectives (the ecological model, the transactional model, attachment theory, the life course perspective, the social learning perspective, and social-biological models) have been analyzed and applied in this conceptual paper. These perspectives offer useful insight into the mechanisms explaining the relationship between maltreatment and behavior problems, while also offering guidance to child welfare practitioners in identifying and responding effectively to children at greatest risk of developing such problems. This analysis revealed many similarities across the six theoretical perspectives, highlighting their complementary nature and providing a solid rationale for integrating knowledge from these perspectives into a conceptual model.

The ecological model offers a broad overarching perspective to which insight from other theoretical perspectives can be incorporated. For instance, social-biological models are naturally complementary to the ecological model and elaborate on factors at the individual biological level that interact with the environment to influence outcomes. Considering both the ecological model and social-biological model allows for deeper insight into the individual level factors that can interact with the environment to increase the likelihood of behavior problems, while also providing insight into the various biological consequences of maltreatment that may occur under specific environmental conditions. Likewise, attachment to caregivers, family members, and peers may be understood within the ecological system. Attachment patterns are considered vitally important within attachment theory and the life course perspective, and when conceptualized through an ecological lens, may be considered one of the many proximal processes that shape development.

Overlap and similarity also exist among the other theoretical perspectives. For instance, the biological basis of infant-caregiver attachment is largely undisputed. Consistent with social-biological models, attachment theory highlights the underlying evolutionary and biological reasons attachment behavior is activated in both caregivers and infants. Attachment behavior is caused by an innate biological system that encourages infants to seek proximity to caregivers and vice versa, a system that is thought to be integral to our survival as a species (Strathearn, 2011). In another example of similarities across the theoretical perspectives, the transactional model and social learning perspective share a focus on inconsistent and harsh discipline, acknowledging that this type of parenting practice can actually reinforce problem behaviors in children and heighten parental frustration. Also consistent with social-biological models, according to the transactional model proposed by Bugental (2009), parents with biological vulnerabilities, specifically those parents who possess easily activated physiological threat response systems, will react more harshly to children's behavior problems than other parents.

A common thread that connects these six perspectives is a focus on the dynamic and complex causes of maltreatment and behavior problems, and an emphasis on the multiple layers of the ecological system that surround a developing child. Avoiding deterministic assumptions, these perspectives do not suggest simple and direct causal links between maltreatment and behavior problems. Rather, the perspectives all highlight that maltreatment and behavior problems may be associated under certain circumstances for certain children, as a result of complex interactions between the child and the surrounding ecology.

3.2. Integration of theory: a conceptual model

A broad conceptual model has been developed through synthesizing the theories analyzed in this paper, in order to deepen current understanding of why maltreatment is associated with externalizing, antisocial, and criminal behavior problems; and how child welfare services can intervene to support maltreated children and youth with these problems. Drawing from transactional models and life course perspectives on crime, a central proposition of this model is that individuals are in constant transaction with their surrounding environments, and that there is both continuity and change in these transactions over time. The environment comprises many levels of the ecological system, including the individual child, family, neighborhood, community, school, culture, social service structure, society, and global environment. Like developing children, child welfare service providers are also influenced by the ecological context (Baumann et al., 2011). The ability of child welfare service providers to offer effective interventions to vulnerable children and families is therefore influenced by various ecological factors, such as policy and funding structures.

According to this conceptual model and consistent with ecological and transactional models, families facing increasing levels of marginalization and accumulating disadvantage are at greater risk of serious, enduring maltreatment, and at greater risk of being referred to child welfare agencies for concerns of abuse and neglect. Likewise, it is hypothesized that behavior problems develop along various pathways, as a result of accumulating disadvantage and cumulative continuity at various levels of the ecological system. For instance, a genetic vulnerability or prenatal medical complication can lead to a situation in which an infant is in constant distress and difficult to soothe, generating feelings of frustration and helplessness in parents and impacting the attachment pattern. This sets the stage for future parent–child interactions and behaviors, whereby the parent views the child as difficult and the child views the parent as unpredictable, distant or critical and incapable of soothing the child's distress. In this example, the child's problematic behavior is likely to escalate over time if the parent has little social support and knowledge of parenting, and few financial resources for respite or for involving the child in recreational activities. This child is more vulnerable to experiencing abuse or neglect because of the context in which he or she lives. In other situations, a child may live in the context of multiple disadvantages that contribute to the development and maintenance of behavior problems. While one of these disadvantages may be maltreatment, others might include disorganized attachment, developmental or other disabilities, impairments in neurobiological processes, deviant peers, school difficulties, and structural marginalization.

Drawing from the ecological model, transactional model, and attachment theory, maltreatment and behavior problems are reciprocally related in this conceptual model. Children with behavior problems and related issues, such as difficult temperament or hyperactivity, are more vulnerable to experiencing maltreatment, as their individual characteristics can elicit a frustrated or harsh response from caregivers, particularly those caregivers who are faced with other stressors. In the context of accumulating disadvantages, this reciprocal relationship can result in an escalation of both maltreatment and problem behaviors, such that both become more severe and chronic. Among others, disadvantages include poor caregiving skills, overactive stress response

systems for caregivers and children, impaired mental representations of relationships, school expulsion, neighborhood disorganization, and lack of connection to the community. If protective factors are present and enduring, however, this reciprocal problematic relationship is likely to diminish. Child welfare services can act as either a further disadvantage or a protective factor, depending on a wide variety of factors including the effectiveness of the service and the willingness and ability of the family to participate in the service.

Applying the concept of turning points highlighted by the life course perspective (Laub & Sampson, 1993), the delivery of child welfare services signifies an important turning point for children and adolescents, in which life course pathways shift. If child welfare services result in the prevention of future maltreatment, improved familial relationships, the generation of new positive relationships at home, in school, and in the community, or fewer risk and more protective factors in the ecological context in which the child is developing, the child is likely to experience a turning point in which behavioral and other forms of adaptation improve. If child welfare services can address the causes of maltreatment while also reducing the accumulating disadvantage in a young person's life, the probability of a positive trajectory shift also increases. If these services result in further disadvantages, such as attachment disturbances due to out-of-home placement instability or heightened stigma due to the school and community learning that a family is involved with the child welfare system, behavior trajectories are likely to worsen. In line with an ecological perspective, the ability of child welfare services to positively influence the developmental trajectories of vulnerable children and youth will be impacted by various factors, including the structural contexts in which they operate.

This conceptual model is limited by its breadth and lack of specificity. The comprehensive review of theory presented in this paper, however, illuminates the complexity of explaining the relationship between maltreatment and behavior problems, and understanding how child welfare services can address such problems among maltreated children. The complexity of these questions demands a broad and multifaceted conceptual model informed by diverse yet complementary theoretical perspectives. Another limitation of this conceptual model is that protective factors are not discussed in the same depth as risk factors. This gap is reflective of the child welfare and criminology literatures, which generally focus on risk.

4. Implications and conclusions

There is little doubt that the relationship between maltreatment and behavior problems is complex to understand and to address. Examining theories of human development, child maltreatment, developmental psychopathology, and criminal behavior is necessary in order to capture the complex processes through which maltreatment and behavior problems are associated, and to determine the best child welfare intervention strategies. The theoretical perspectives reviewed in this paper highlight the many and diverse mechanisms that explain why maltreatment is related to behavior problems. These heterogeneous and complicated factors make it particularly difficult to understand the magnitude, direction, and significance of the relationship between maltreatment and behavior problems. It is therefore important but not sufficient to examine single mechanisms at particular levels of the ecological system. Rather, it is critical to integrate both empirical and theoretical knowledge from across disciplines and levels of analysis, ranging from the individual child level to the systemic level. Prevention and intervention efforts must be informed by the understanding of mechanisms at every level of the ecological system that explain the relationship between maltreatment and behavior problems.

It is critical to consider every level of analysis and insights from across disciplines in order to attain a clear picture of the cumulative risk and protective factors influencing a child. Based on the reviewed theoretical perspectives, it becomes clear that children living in the

context of accumulating risk are more likely to experience maltreatment and more likely to develop behavior problems, and generally suffer more serious consequences for their deviant behaviors because they do not have sufficient buffering or protective resources. While it is not possible for child welfare practitioners to address all of the disadvantages in the lives of vulnerable children, attention to cumulative risk and protective factors is critical for several reasons. Assessing accumulating risk can provide predictive insight into which maltreated children are at greatest risk of developing behavior problems and experiencing recurrent victimization, allowing child welfare workers to target interventions for the most vulnerable children. Understanding the importance of the accumulation of factors at all ecological levels, child welfare workers can then facilitate access to services specifically designed to address the multiple complex needs of vulnerable children and families. For instance, child welfare workers can connect families to parent training programs focused on managing difficult child behaviors while also advocating for enhanced supports in the school environment and facilitating access to stable housing and social benefits to reduce family stress.

The theoretical perspectives synthesized in this paper point to several additional intervention strategies. Given the importance of attachments and bonds, it is important that child welfare service providers offer interventions focused on improving the quality of caregiver-child and other family relationships. This focus on relationships should be prominent when working with children and youth of all ages, from infancy to adolescence. Knowledge from attachment theory will help child welfare service providers to support the development of a secure attachment relationship between caregivers and infants and young children. With a focus on relationships, child welfare workers can also help older children and youth by intervening to assist parents in managing difficult child behaviors, resolving conflict, building warm and supportive relationships, and effectively monitoring and supervising young people.

Specific intervention strategies may also be derived based on the reviewed criminological and social-biological theories. Given the importance of developing prosocial capacities, children and youth who have experienced maltreatment may benefit from interventions focused on promoting the acquisition of capacities such as self-regulation, problem solving, and empathy. Interventions focused on fostering positive attachments to institutions like school and work may also be helpful. In line with the theories analyzed in this paper, such interventions may prevent or alleviate behavior problems among maltreated children and youth. For example, with younger children, child welfare workers can facilitate access to developmental psychologists and liaise with school personnel to ensure adequate support. For older children and youth, child welfare workers can engage with young people to explore future career options and assist in academic planning.

While it is important to apply theory when developing intervention strategies, it is also critical to utilize theory to examine systemic and other issues that impact the ability of child welfare service providers to effectively meet the complex needs of vulnerable children and families. Research is needed to identify and evaluate the ecological factors that impact the ability of child welfare service providers to effectively intervene in the complex situations in which a child has experienced maltreatment and displays behavior problems. Addressing system-level issues will support the delivery of effective, theory-driven interventions focused on addressing the complex and multifaceted needs of maltreated children and youth who demonstrate externalizing, antisocial, and criminal behaviors.

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References

- Aalsma, M. C., Liu, G. C., & Wiehe, S. E. (2011). The role of perceived parent monitoring and support on urban child and adolescent problem behavior. *Community Mental Health Journal*, 47, 61–66.
- Ainsworth, M. D. (1979). Infant mother attachment. *American Psychologist*, 34(10), 932–937.
- Ainsworth, M. D., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, NJ: Erlbaum.
- Allwood, M. A., & Widom, C. S. (2013). Child abuse and neglect, developmental role attainment, and adult arrests. *Journal of Research in Crime and Delinquency*, 50(4), 551–578.
- Baer, J. C., & Martinez, C. D. (2006). Child maltreatment and insecure attachment: A meta-analysis. *Journal of Reproductive and Infant Psychology*, 24(3), 187–197.
- Bandura, A. (1971). *Social learning theory*. New York: General Learning Press.
- Bandura, A. (1973). *Aggression: A social learning analysis*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1978). Social learning theory of aggression. *Journal of Communication*, 28(3), 12–29.
- Baumann, D. J., Dalgleish, L. I., Fluke, J. D., & Kern, H. D. (2011). *The decision-making ecology*. Washington, DC: American Humane Association.
- Baumann, D. J., Kern, H., & Fluke, J. (1997). Foundations of the decision-making ecology and overview. In H. Kern, D. J. Baumann, & J. Fluke (Eds.), *Worker improvements to the decision and outcome model (WISDOM): The child welfare decision enhancement project*. Washington, DC: The Children's Bureau.
- Beirne, P. (1988). Heredity versus environment: A reconsideration of Charles Goring's *The English Convict* (1913). *The British Journal of Criminology*, 28(3), 315–339.
- Belsky, J. (1980). Child maltreatment: An ecological integration. *American Psychologist*, 35(4), 320–335.
- Belsky, J. (1984). The determinants of parenting: A process model. *Child Development*, 55, 83–96.
- Belsky, J. (1993). Etiology of child maltreatment: A developmental-ecological analysis. *Psychological Bulletin*, 114(3), 413–434.
- Bowlby, J. (1944). Forty-four juvenile thieves: Their characters and home life. *The International Journal of Psycho-Analysis*, 25, 107–127.
- Bowlby, J. (1969). *Attachment and loss: Volume 1*. New York: Basic Books.
- Bowlby, J. (1973). *Attachment and loss: Volume 2*. New York: Basic Books.
- Bremner, J. D., Randall, P., Vermetten, E., Staib, L., Bronen, R. A., Mazure, C., ... Charney, D. S. (1997). Magnetic resonance imaging-based measurements of hippocampal volume in posttraumatic stress disorder related to childhood physical and sexual abuse – A preliminary report. *Biological Psychiatry*, 41, 23–32.
- Bronfenbrenner, U. (1974). Developmental research, public policy, and the ecology of childhood. *Child Development*, 45(1), 1–5.
- Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist*, 32, 515–531.
- Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.
- Bronfenbrenner, U. (1994). Ecological models of human development. (2nd ed.). *International Encyclopedia of education*, Vol. 3. Oxford: Elsevier.
- Bugental, D. (2009). Predicting and preventing child maltreatment: A biocognitive transactional approach. In A. Sameroff (Ed.), *The transactional model of development* (pp. 97–115). Washington, D.C.: American Psychological Association.
- Bugental, D. B., Blue, J., & Lewis, J. (1990). Caregiver beliefs and dysphoric affect directed to difficult children. *Developmental Psychology*, 26, 631–638.
- Bugental, D. B., Mantayla, S. M., & Lewis, J. (1989). Parental attributions as moderators of affective communication to children at risk for physical abuse. In D. Cicchetti, & V. Carlson (Eds.), *Child maltreatment: Theory and research on the causes and consequences of child abuse and neglect* (pp. 254–279). Cambridge: Cambridge University Press.
- Burnette, M. L. (2013). Gender and the development of oppositional defiant disorders: Contributors of physical abuse and early family environment. *Child Maltreatment*, 18(3), 195–204.
- Burnette, M. L., Oshri, A., Lax, R., Richards, D., & Ragbeer, S. N. (2012). Pathways from harsh parenting to adolescent antisocial behavior: A multidomain test of gender moderation. *Development and Psychopathology*, 24, 857–870.
- Campbell, K. A., Thomas, A., Cook, L. J., & Keenan, H. T. (2013). Resolution of intimate partner violence and child behavior problems after investigation for suspected child maltreatment. *JAMA Pediatrics*, 167(3), 236–242.
- Caspi, A., McClay, J., Moffitt, T. E., Mill, J., Martin, J., Craig, I. W., et al. (2002). Role of genotype in the cycle of violence in maltreated children. *Science*, 297(2), 851–854.
- Caspi, A., Moffitt, T. E., Morgan, J., Rutter, M., Taylor, A., Arseneault, L., et al. (2004). Maternal expressed emotion predicts children's antisocial behavior problems: Using monozygotic twin differences to identify environmental effects on behavioral development. *Developmental Psychology*, 40(2), 149–161.
- Catalano, R. F., Park, J., Harachi, T. W., Haggerty, K. P., Abbott, R. D., & Hawkins, J. D. (2005). Mediating effects of poverty, gender, individual characteristics, and external constraints on antisocial behavior: A test of the social development model and implications for developmental life-course theory. In D. P. Farrington (Ed.), *Integrated developmental and life-course theories of offending, advances in criminological theory*, Vol. 14. (pp. 93–124). New Brunswick, USA: Transaction Publishers.
- Cecil, C. A. M., Viding, E., Barker, E. D., Guiney, J., & McCrory, E. J. (2014). Double disadvantage: The influence of childhood maltreatment and community violence exposure on adolescent mental health. *Journal of Child Psychology and Psychiatry*, 55(7), 839–848.
- Cicchetti, D., & Lynch, M. (1993). Toward an ecological/transactional model of community violence and child maltreatment: Consequences for children's development. *Psychiatry*, 56, 96–118.
- Cicchetti, D., & Lynch, M. (1995). Failures in the expectable environment and their impact on individual development: The case of child maltreatment. In D. Cicchetti, & D. J.

- Cohen (Eds.), *Developmental psychopathology, volume 2: Risk, disorder, and adaptation* (pp. 32–71). New York: John Wiley & Sons.
- Cicchetti, D., & Toth, S. L. (2005). Child maltreatment. *Annual Review of Clinical Psychology, 1*, 409–438.
- Côté, S. M. (2009). A developmental perspective on sex differences in aggressive behaviors. In R. E. Tremblay, M. A. G. van Aken, & W. Koops (Eds.), *Development and prevention of behavior problems* (pp. 143–164). New York: Psychology Press.
- Crittenden, P. M. (1985). Social networks, quality of child rearing, and child development. *Child Development, 56*(5), 1299–1313.
- Crittenden, P. M. (2000). Dynamic-maturational exploration of the meaning of security and adaptation: Empirical, cultural and theoretical considerations. In P. M. Crittenden, & A. H. Claussen (Eds.), *The organization of attachment relationships* (pp. 358–383). Cambridge, UK: Cambridge University Press.
- Crittenden, P. M., & Ainsworth, M. D. S. (1989). Child maltreatment and attachment theory. In D. Cicchetti, & V. Carlson (Eds.), *Child maltreatment: Theory and research on the causes and consequences of child abuse and neglect* (pp. 432–463). Cambridge: Cambridge University Press.
- Cutuli, J. J., Raby, K. L., Cicchetti, D., Englund, M. M., & Egeland, B. (2013). Contributions of maltreatment and serotonin transporter genotype to depression in childhood, adolescence, and early adulthood. *Journal of Affective Disorders, 149*, 30–37.
- De Bellis, M. D. (2005). The psychobiology of neglect. *Child Maltreatment, 10*, 150–173.
- De Bellis, M. D., Keshavan, M. S., Clark, D. B., Casey, B. J., Giedd, J. N., Boring, A. M., ... Ryan, N. D. (1999). Developmental traumatology, part II: Brain development. *Society of Biological Psychiatry, 45*, 1271–1284.
- De Haan, A., Prinzie, P., & Dekovic, M. (2012). Change and reciprocity in adolescent aggressive and rule-breaking behaviors and parental support and dysfunctional discipline. *Development and Psychopathology, 24*, 301–315.
- Dishion, T. J., Capaldi, D. M., & Yoerger, K. (1999). Middle childhood antecedents to progressions in male adolescent substance use: An ecological analysis of risk and protection. *Journal of Adolescent Research, 14*(2), 175–205.
- Egeland, B., & Sroufe, L. A. (1981). Attachment and early maltreatment. *Child Development, 52*(1), 44–52.
- Ellenbogen, S., Trocmé, N., & Wekerle, C. (2013). The relationship between dimensions of physical abuse and aggressive behavior in a child protective services involved sample of adolescents. *Journal of Child & Adolescent Trauma, 6*, 91–105.
- Farrington, D. P. (2005). Introduction to integrated developmental and life-course theories of offending. In D. P. Farrington (Ed.), *Integrated developmental and life-course theories of offending, advances in criminological theory, Vol. 14*. (pp. 1–14). New Brunswick, USA: Transaction Publishers.
- Fearon, R. P., Bakermans-Kranenburg, M. J., van Ijzendoorn, M. H., Lapsley, A. M., & Roisman, G. I. (2010). The significance of insecure attachment and disorganization in the development of children's externalizing behavior: A meta-analytic study. *Child Development, 81*(2), 435–456.
- Feerick, M. M., Haugaard, J. J., & Hien, D. A. (2002). Child maltreatment and adulthood violence: The contribution of attachment and drug use. *Child Maltreatment, 7*(3), 226–240.
- Garbarino, J., & Plantz, M. C. (1986). Child abuse and juvenile delinquency: What are the links? In J. Garbarino, C. J. Schellenbach, & J. M. Sebes (Eds.), *Troubled youth, troubled families: Understanding families at risk for adolescent maltreatment* (pp. 27–39). New York: Aldine Publishing Company.
- Gauthier, Y., Fortin, G., & Jeliu, G. (2004). Clinical application of attachment theory in permanency planning for children in foster care: The importance of continuity of care. *Infant Mental Health Journal, 25*(4), 379–396.
- Gorman-Smith, D., Tolan, P. H., & Henry, D. B. (2000). A developmental-ecological model of the relation of family functioning to patterns of delinquency. *Journal of Quantitative Criminology, 16*(2), 169–198.
- Gromoske, A. N., & Maguire-Jack, K. (2012). Transactional and cascading relations between early spanking and children's social-emotional development. *Journal of Marriage and Family, 74*, 1054–1068.
- van Harmelen, A. L., van Tol, M. J., van der Wee, N. J. A., Veltman, D. J., Aleman, A., Spinhoven, P., et al. (2010). Reduced medial prefrontal cortex volume in adults reporting childhood emotional maltreatment. *Biological Psychiatry, 68*, 832–838.
- Herrenkohl, T. I., Huang, B., Tajima, E. A., & Whitney, S. D. (2003). Examining the link between child abuse and youth violence: An analysis of mediating mechanisms. *Journal of Interpersonal Violence, 18*(10), 1189–1208.
- Hirschi, T. (1969). *Causes of delinquency*. Berkeley: University of California Press.
- Hoffmann, J. P. (2011). *Delinquency theories: Appraisals and applications*. London: Routledge.
- Ireland, T. O., Smith, C. A., & Thornberry, T. P. (2002). Developmental issues in the impact of child maltreatment on later delinquency and drug use. *Criminology, 40*(2), 359–401.
- Jenson, J. M., & Fraser, M. W. (2006). A risk and resilience framework for child, youth, and family policy. In J. M. Jenson, & M. W. Fraser (Eds.), *Social policy for children and families: A risk and resilience perspective* (pp. 1–18). Thousand Oaks, CA: Sage.
- Jonson-Reid, M. (1998). Youth violence and exposure to violence in childhood: An ecological review. *Aggression and Violent Behavior, 3*(2), 159–179.
- Keil, V., & Price, J. M. (2006). Externalizing behavior disorders in child welfare settings: Definition, prevalence, and implications for assessment and treatment. *Children and Youth Services Review, 28*, 761–779.
- Laub, J. H., & Sampson, R. J. (1993). Turning points in the life course: Why change matters to the study of crime. *Criminology, 31*(3), 301–325.
- Laub, J. H., & Sampson, R. J. (2001). Turning points in the life course: Why change matters to the study of crime. In R. C. Smandych (Ed.), *Youth crime: Varieties, theories, and prevention* (pp. 57–79). Harcourt Canada: Toronto.
- Limke, A., Showers, C. J., & Zeigler-Hill, V. (2010). Emotional and sexual maltreatment: Anxious attachment mediates psychological adjustment. *Journal of Social and Clinical Psychology, 29*(3), 347–367.
- Lochman, J. E. (2004). Contextual factors in risk and prevention research. *Merrill-Palmer Quarterly, 50*(3), 311–325.
- Lowell, A., Renk, K., & Adgate, A. H. (2014). The role of attachment in the relationship between child maltreatment and later emotional and behavioral functioning. *Child Abuse & Neglect, 38*, 1436–1449.
- MacKenzie, M. J., Kotch, J. B., Lee, L. C., Augsberger, A., & Hutto, N. (2011). A cumulative ecological-transactional risk model of child maltreatment and behavioral outcomes: Reconceptualizing early maltreatment report as risk factor. *Children and Youth Services Review, 33*, 2392–2398.
- Main, M., & Hesse, E. (1990). Parents' unresolved traumatic experiences are related to infant disorganized attachment status: Is frightened and/or frightening behavior the linking mechanism? In M. T. Greenberg, D. Cicchetti, & E. M. Cummins (Eds.), *Attachment in the preschool years* (pp. 161–181). Chicago: University of Chicago Press.
- Main, M., & Solomon, J. (1986). Discovery of an insecure-disorganized/disoriented attachment pattern. In B. T. Brazelton, & B. T. Yogman (Eds.), *Affective development in infancy* (pp. 95–124). Westport, CT: Ablex.
- Marsh, I., Melville, G., Norris, G., & Walkington, Z. (2006). *Theories of crime*. London: Routledge.
- Matsueda, R. L., & Heimer, K. (2001). A symbolic interactionist theory of role-transitions, role-commitments, and delinquency. In R. C. Smandych (Ed.), *Youth crime: varieties, theories, and prevention*. Toronto: Harcourt Canada.
- McCrory, E., De Brito, S. A., & Viding, E. (2010). Research review: The neurobiology and genetics of maltreatment and adversity. *Journal of Child Psychology and Psychiatry, 51*(10), 1079–1095.
- McKinlay, A., van Vliet-Ruissen, C., & Taylor, A. (2014). Traumatic brain injury among mothers identified as having a high risk of child maltreatment: A pilot study. *Journal of Family Violence, 29*, 391–395.
- Minh, A., Matheson, F. I., Daoud, N., Hamilton-Wright, S., Pederson, C., Borenstein, H., et al. (2013). Linking childhood and adult criminality: Using a life course framework to examine child abuse and neglect, substance use and adult partner violence. *International Journal of Environmental Research and Public Health, 10*, 5470–5489.
- Moffitt, T. E. (1993). Adolescence-limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychological Review, 100*(4), 674–701.
- Osher, D., Van Acker, R., Morrison, G. M., Gable, R., Dwyer, K., & Quinn, M. (2004). Warning signs of problems in schools: Ecological perspectives and effective practices for combatting school aggression and violence. *Journal of School Violence, 3*(2/3), 13–37.
- Patterson, G. R. (1982). *Coercive family process*. Eugene, OR: Castalia.
- Postlethwait, A. W., Barth, R. P., & Guo, S. (2010). Gender variation in delinquent behavior changes of child welfare-involved youth. *Children and Youth Services Review, 32*, 318–324.
- Raine, A. (2008). From genes to brain to antisocial behavior. *Current Directions in Psychological Science, 17*(5), 323–328.
- Ryan, J. P., Williams, A. B., & Courtney, M. E. (2013). Adolescent neglect, juvenile delinquency and the risk of recidivism. *Journal of Youth and Adolescence, 42*, 454–465.
- Sameroff, A. (2009). The transactional model. In A. Sameroff (Ed.), *The transactional model of development: How children and contexts shape each other* (pp. 3–22). Washington, DC: American Psychological Association.
- Sameroff, A. J., & Chandler, M. J. (1975). Reproductive risk and the continuum of caretaking casualty. In F. D. Horowitz, E. M. Hetherington, S. Scarr-Salapatek, & G. Siegel (Eds.), *Review of child development research volume 4*. Chicago: University of Chicago Press.
- Sameroff, A. J., Bartko, W. T., Baldwin, A., Baldwin, C., & Seifer, R. (1998). Family and social influences on the development of child competence. In M. Lewis, & C. Feiring (Eds.), *Families, risk, and competence* (pp. 161–186). Mahwah, NJ: Erlbaum Associates.
- Sampson, R. J., & Laub, J. H. (1994). Urban poverty and the family context of delinquency: A new look at structure and process in a classic study. *Child Development, 65*, 523–540.
- Sampson, R. J., & Laub, J. H. (2005). A life-course view of the development of crime. *The Annals of the American Academy, 602*, 12–45.
- Scannapieco, M., & Connell-Carrick, K. (2005). *Understanding child maltreatment: An ecological and developmental perspective*. New York: Oxford University Press.
- Simons, R. L., Simons, L. G., & Wallace, L. E. (2004). *Families, delinquency, and crime: Linking society's most basic institution to antisocial behavior*. Los Angeles, California: Roxbury Publishing Company.
- Snyder, J., Reid, J., & Patterson, G. (2003). A social learning model of child and adolescent antisocial behavior. In B. B. Lahey, T. E. Moffitt, & A. Caspi (Eds.), *Causes of conduct disorder and juvenile delinquency* (pp. 27–48). New York: Guilford Press.
- Sousa, C., Herrenkohl, T. I., Moylan, C. A., Tajima, E. A., Klika, J. B., Herrenkohl, R. C., et al. (2011). Longitudinal study on the effects of child abuse and children's exposure to domestic violence, parent-child attachments, and antisocial behavior in adolescence. *Journal of Interpersonal Violence, 26*(1), 111–136.
- Sroufe, L. A., Carlson, E. A., Levy, A. K., & Egeland, B. (1999). Implications of attachment theory for developmental psychopathology. *Development and Psychopathology, 11*, 1–13.
- Stewart, A., Livingston, M., & Dennison, S. (2008). Transitions and turning points: Examining the links between child maltreatment and juvenile offending. *Child Abuse & Neglect, 32*, 51–66.
- Strathearn, L. (2011). Maternal neglect: Oxytocin, dopamine and the neurobiology of attachment. *Journal of Neuroendocrinology, 23*, 1054–1065.
- Stringer, S. A., & La Greca, A. M. (1985). Correlates of child abuse potential. *Journal of Abnormal Psychology, 13*(2), 217–226.
- Suldo, S. M., Mihalas, S., Powell, H., & French, R. (2008). Ecological predictors of substance use in middle school students. *School Psychology Quarterly, 23*(3), 373–388.
- Szapocznik, J., & Coatsworth, J. D. (1999). An ecodevelopmental framework for organizing the influences on drug abuse: A developmental model for risk and prevention. In M. Glantz, & C. R. Hartel (Eds.), *Drug abuse: Origins and interventions* (pp. 331–366). Washington, DC: American Psychological Association.
- Tabone, J. K., Guterman, N. B., Litrownik, A. J., Dubowitz, H., Isbell, P., English, D. J., et al. (2011). Developmental trajectories of behavior problems among children who have

- experienced maltreatment: Heterogeneity during early childhood and ecological predictors. *Journal of Emotional and Behavioral Disorders*, 19(4), 204–216.
- Teicher, M. H., Dumont, N. L., Vaituzis, C., Giedd, J. N., & Andersen, S. L. (2004). Childhood neglect is associated with reduced corpus callosum area. *Biological Psychiatry*, 56, 80–85.
- Thompson, R., & Tabone, J. K. (2010). The impact of early alleged maltreatment on behavioral trajectories. *Child Abuse & Neglect*, 34, 907–916.
- Thornberry, T. P. (1987). Toward an interactional theory of delinquency. *Criminology*, 25(4), 863–891.
- Thornberry, T. P., & Henry, K. L. (2013). Intergenerational continuity in maltreatment. *Journal of Abnormal Child Psychology*, 41, 555–569.
- Thornberry, T. P., & Krohn, M. D. (2005). Applying interactional theory to the explanation of continuity and change in antisocial behavior. In D. P. Farrington (Ed.), *Integrated developmental and life-course theories of offending, advances in criminological theory, Vol. 14*. (pp. 183–210). New Brunswick, USA: Transaction Publishers.
- Tucker, D. J., & MacKenzie, M. J. (2012). Attachment theory and change processes in foster care. *Children and Youth Services Review*, 34, 2208–2219.
- Twardosz, S., & Lutzker, J. R. (2010). Child maltreatment and the developing brain: A review of neuroscience perspectives. *Aggression and Violent Behavior*, 15, 59–68.
- Tzeng, O., Jackson, J., & Karlson, H. (1991). *Theories of child abuse and neglect: Differential perspectives*. New York: Praeger.
- Verrecchia, P. J., Fetzter, M. D., Lemmon, J. H., & Austin, T. L. (2010). An examination of direct and indirect effects of maltreatment dimensions and other ecological risks on persistent youth offending. *Criminal Justice Review*, 35(2), 220–243.
- Vondra, J. L., & Toth, S. L. (1989). Ecological perspectives on child maltreatment: Research and intervention. *Early Child Development and Care*, 42(1), 11–29.
- White, R., & Renk, K. (2012). Externalizing behavior problems during adolescence: An ecological perspective. *Journal of Child and Family Studies*, 21, 158–171.
- Wiehe, V. R. (1989). Child abuse: An ecological perspective. *Early Child Development and Care*, 42(1), 141–149.
- Williams, L. M. (2003). Understanding child abuse and violence against women: A life course perspective. *Journal of Interpersonal Violence*, 18(4), 441–451.
- Zadeh, Z. Y., Jenkins, J., & Pepler, D. (2010). A transactional analysis of maternal negativity and child externalizing behavior. *International Journal of Behavioral Development*, 34(3), 218–228.