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## Understanding Persistence and Desistance in Crime and Risk Behaviors in Adulthood: Implications for Theory and Prevention

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### Abstract

Recent theoretical advances related to the development and course, including persistence and desistance, of antisocial behaviors and conduct problems, violent behaviors, and related problem behaviors are discussed. Integrative theoretical models, including the Dynamic Developmental Systems (DDS) model, are discussed. Aspects of the DDS model regarding the development of and change in antisocial behavior and violence across adolescence and early adulthood are illustrated with findings from the Oregon Youth Study, an ongoing, long-term examination of the causes and consequences of antisocial behavior for a community-based sample of men (and their romantic partners) who were raised in neighborhoods with high delinquency rates. Preventive implications of the model are discussed.

### Keywords

violence; lifespan; suicide; intimate partner violence

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Over the past several decades there has been much research activity regarding the causes of risk behaviors during childhood and adolescence, with a primary focus on factors involved in the development of antisocial and associated problem behaviors, such as crime, violence, substance use, risky sexual behavior, and intimate partner violence (Bachanas et al., 2002;

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#### Compliance with Ethical Standards

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**Ethical approval:** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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Barker & Maughan, 2009; Cano, Avery-Leaf, Cascardi, & O'Leary 1998; Loeber, Burke, & Pardini, 2009; Obot, Wagner, Anthony, 2001). While such work continues, the attention of developmental researchers has turned in recent years to trying to understand the persistence and desistance of problem behaviors in adulthood (e.g., Hussong, Curran, Moffitt, Caspi, & Carrig, 2004). The accruing evidence on development across the lifespan has led to proposals for more dynamic and theoretically integrative models than those that have guided past research (e.g., Lerner, 2012). Accordingly, whereas our own work was originally based on a social learning model of the development of problem behaviors (Wiesner, Capaldi, & Patterson, 2003), it now involves a broader and more integrative Dynamic Developmental Systems (DDS) approach (Capaldi, Shortt, & Kim, 2005; Capaldi & Wiesner, 2009). In parallel, statistical approaches for testing complex models like DDS—particularly involving intraindividual and interindividual change over time—have developed substantially in recent years, providing momentum for the field to move forward in theoretical approaches (Laursen, Little, & Card, 2012; Molenaar, Lerner, & Newell, 2014; Overton, & Lerner, 2010). A further development in recent years is an interest in the development of men, including their transitions into adulthood and desistance from problem behaviors, health, and roles as romantic partners/husbands and as fathers (Lewis & Sussman, 2013). The Oregon Youth Study (OYS) is a study of the development of boys and men, and thus these issues are focal to this presentation.

In this paper, the central role of development in changes in problem behaviors is presented, and the related evolution in theoretical approaches to problem behaviors in adolescence and early adulthood in recent years is reviewed. Key issues are illustrated by the DDS approach and its application within recent studies conducted with the OYS sample—a longitudinal study of boys from at-risk neighborhoods who have been assessed nearly annually from the age of 10 years to their late 30's. Finally, implications for prevention are discussed.

## The Central Role of Developmental Change in Problem Behaviors

A key characteristic of violence, crime, and other problem behaviors is that age is arguably the strongest predictor (Steffensmeier & Allan, 2000). This contrasts sharply with a more traditional focus on relatively enduring individual differences that emerge across childhood and adolescence (Moffitt, Caspi, Harrington, & Milne, 2002). Antisocial behaviors and consequences, such as police contact and system involvement, increase to peak around ages 15 to 19 years and then decline substantially across young adulthood (Blumstein, Cohen, Roth, & Visser, 1986). Similarly, intimate partner violence peaks in young adulthood and then declines (Kim, Laurent, Capaldi, & Feingold, 2008); sexual risk behavior, as indexed by the number of sexual partners, peaks in late adolescence or young adulthood (Capaldi, Stoolmiller, Clark, & Owen, 2002); and particularly problematic levels of the use of various substances (i.e., heavy episodic drinking, illicit drug use) peak in a similar fashion (Capaldi, Feingold, Kim, Yoerger, & Washburn, 2013; Washburn & Capaldi, 2014).

An especially interesting finding that has emerged in recent years is that most individuals show declines in problem behaviors as they age, even if they showed very high levels of such behaviors during late adolescence and early adulthood (Monahan, Steinberg, Cauffman, & Mulvey, 2009; Wiesner, Capaldi, & Kim, 2007). Thus, contrary to predictions that

decreases in crime and problem behaviors would be seen in less severe *adolescence limited* groups, but not in more severe individuals who would be *lifespan persistent* (Moffitt, 1993, 1997), the trend that problem behaviors lessen with age appears to be relatively (although not completely) universal. For example, in a follow-up of youth involved with the juvenile justice system (i.e., an already severe group), the majority (about 80%) of boys who showed a particularly high number of different antisocial acts at age 14 years (29% of the sample) showed substantial desistance in late adolescence and early adulthood (Monahan et al., 2009). Similarly, examination of arrest frequencies from ages 10 to 26 years for OYS men indicated that, contrary to prediction from the lifespan persistent/adolescent limited model (Moffitt, 1993, 1997), later onset offenders did not account for the peak of crime in adolescence; rather, the highest level and most persistent offenders showed the strongest increase to a peak at ages 15 to 16 years, followed by a decrease almost to the level of desistance of moderate offenders (Wiesner et al., 2007).

These findings regarding desistance from problem behaviors have important implications for theory and research. First, studies that develop theories on adolescents and make predictions about changes as adolescents mature into adulthood are critically incomplete unless they extend well into adulthood to test these prediction. Second, age and development must be at the center of models regarding human behavior. It appears to not just be a case of social learning processes or physiological processes (e.g., Grigorenko et al., 2010) setting the course for problem behaviors in childhood and adolescence, whereby the behaviors become established, a pattern is set, and then they continue to be displayed indefinitely. Rather, these behaviors change, sometimes very substantially, over time. Change must be at the center of theory. Third, analytical methods appropriate for examining changes of theoretical interest must be used, such as the modeling of interindividual differences in intraindividual change (e.g., Nesselrode, 1991). These issues are important to consider in the context of the few existing theories of problem behaviors that focus on change in adolescence and adulthood.

## Turning Point Theory

Marriage has been examined as a potentially key turning point in the life course of criminally involved men (Sampson & Laub, 1990). Marriage has a main effect on crime, accounting for a 35% average reduction in the probability of committing crime (Sampson, Laub, & Wimer, 2006). Furthermore, intraindividual analyses over time indicate that the same man commits less crime when married than when not (Sampson & Laub, 2005). Thus, marriage appears to be a protective factor for men. Because women generally engage in less crime than men, men who pair with female partners who display even a moderate amount of antisocial behavior may show a net decrease in deviant peer associations (Capaldi, Kim, & Owen, 2008). Sampson and Laub (1990, 2005) posit that attachment or bonding to a partner is the key social control mechanism of marriage, and they found evidence supporting this. However, their measure of attachment (from an historic study) appeared to tap economic and personality issues rather than traditional interpersonal/psychological notions of attachment. A within-participants study of the OYS men's crime trajectories from ages 12 to 31 years supported that men showed fewer arrests and less self-reported crime when married than when single, but there were no differences when men were cohabitating versus when they were single (Kerr, Capaldi, Owen, Wiesner, & Pears, 2011). In short, there is evidence that

marriage relates to crime desistance, but it is less clear that the mechanism involved is attachment per se.

Another possible key turning point is parenthood. Compared to marriage, fatherhood has been less considered as a turning point in men's lives. Parenthood increases pressure for social conformity—including stable employment and stable intimate relationships—both of which are incompatible with crime and other problem behaviors, such as heavy drinking and drug use. Consistent with theories of differential association and social learning, fathers' greater involvement with children, partners, and family may reduce the time available to socialize with male peers in contexts that support crime, as suggested in the substance use literature (Labouvie, 1996). Several of these points are illustrated well in the OYS. For OYS men's crime, alcohol, and tobacco trajectories across ages 12 to 31 years, first fatherhood was associated with accelerated decreases relative to expected developmental desistance trends, controlling for marriage and cohabitation. Much of the effect was explained by men's co-residence with children. Further, immediate decreases in crime following first fatherhood were stronger for men who made this transition at an older versus a younger age (Kerr et al., 2011). Thus, developmental timing was a moderator of the association of crime desistance and first fatherhood. Findings from Kerr et al. (2011) indicated that first fatherhood was associated with two differing kinds of developmental desistance. First, a level shift effect was observed, whereby a drop in the trajectory at the time of first fatherhood was seen for alcohol and tobacco use, bumping it to a lower trajectory and, second, a deflection effect was seen, whereby the crime trajectory showed deceleration (i.e., a slope decrease) following first fatherhood. Thus, influential events may have short- or long-term effects on desistance of problem behaviors in adulthood, and at times, possibly both.

A key factor that both marriage and fatherhood can influence is association with delinquent peers. Whereas it is well established that association with delinquent peers is strongly related to adolescent offending (Dishion & Patterson, 2006; Elliott & Menard, 1996; Moffitt, 1993), there has been less work regarding withdrawal from deviant peer associations and desistance from crime. There is evidence, however, that withdrawal and desistance are associated. Capaldi et al. (2008) found that men's deviant peer associations in early adulthood were associated with persistence in crime, even controlling for other significant predictors, such as prior arrest history and antisocial influences from a romantic partner. Giordano found that even serious offenders became less accepting of deviant peer influence in adulthood, and some made efforts to develop and sustain less deviant friendships (Giordano, Cernkovich, & Holland, 2003). Others have found that life events in adulthood influence deviant peer associations. For example, Warr (1998) demonstrated that the transition to marriage was accompanied by a dramatic decline in time spent with friends and reduced exposure to delinquent peers.

In summary, the occurrence of a turning point like marriage, and related changes such as withdrawal from deviant associations, appear to influence desistance and point to important possibilities for prevention of subsequent problem behaviors. For example, programs to reduce problem behaviors and change peer associations around the time of first fatherhood may capitalize on a relatively high motivation for desistance at that time. Despite the promise, however, these influences address only part of the picture of persistence and

desistance in problem behaviors. As Thornberry (2005) points out, the movement toward desistance seems to start for many individuals at a relatively early age, before transitions to marriage, work, and family. Other pieces of the behavioral change puzzle are potential physiological and neurological explanations of persistence and desistance in problem behaviors, and how these may interact with one another and social learning factors during critical periods of development.

## Dual Systems Theory

Addressing physiological and neurological developmental changes related to both the emergence of problem behaviors and to desistance, Steinberg (2008, 2010) and others (Casey, Getz, & Galvan, 2008) developed a dual systems hypothesis of adolescent risk taking. A key aspect of the theory is that a sharp increase in dopaminergic activity in the limbic and paralimbic areas of the brain, characterized as the socioemotional system, leads to increases in reward seeking and risk taking in adolescence. Further, the increase in reward seeking is thought to occur prior to the structural maturation of the cognitive control system (mainly involving the lateral prefrontal and parietal cortices and parts of the anterior cingulate cortex to which they are connected) and its connections to the socioemotional areas. As stated by Steinberg (2010), the maturational process is gradual:

“[it] unfolds over the course of adolescence, and permits more advanced self-regulation and impulse control. The temporal gap between the arousal of the socioemotional system, which is an early adolescent development, and the full maturation of the cognitive control system, which occurs later, creates a period of heightened vulnerability to risk-taking during middle adolescence” (p. 216).

Steinberg and colleagues have found evidence that social influences interact with brain activity in ways that may increase adolescent vulnerability. Chein, Albert, O’Brien, Uckert, and Steinberg (2011) theorized that peers may contribute to adolescent risk-taking behaviors by sensitizing brain regions associated with anticipation of rewards. Using fMRI to measure physiological activity during a driving task, they found that adolescents, but not adults, showed greater activation in reward-related brain regions when peers were present, and that such activation predicted risk taking. These findings emphasize the importance of developmental stages of key physiological systems, in this case, within the brain, and of interactions including between social and physiological influences in predicting problematic behaviors.

Given such findings, parents, those who work with adolescents, and designers of prevention programs for adolescents that target problem behaviors should be aware of the ways in which adolescents differ fundamentally from children and adults. Approaches need to address the vulnerabilities and strengths present at each age. For example, it may be appropriate for adolescents to drive, but it may be optimal for both individual and public safety if usually they are not allowed to drive with peers. Finding effective ways to support youth by following simple practices that circumvent potentially dangerous situations should be a key focus of prevention. There is evidence not just that the maturational sequences in brain development relate to adolescent vulnerability to problem behaviors, but also that individual differences in such development relate to levels of these behaviors. A brain

imaging study involving a cautious versus risky decision-making task found that boys with conduct disorders show extensive neural hypoactivity in the regions of the brain responsible for impulse control during risky decision making, as well as both decreased activity during reward outcomes and increased activity during loss outcomes (Crowley et al., 2010). These neural patterns may underlie the excessive and dangerous risk taking of such boys. A study of desistance of youth with serious histories of offending (Monahan et al., 2009) confirmed that youths who persisted in antisocial behavior showed deficits in psychosocial maturity, including in impulse control and suppression of aggression. In a review of fMRI and other brain imaging studies, Bellani, Garzitto, and Brambilla (2012) found disruptive behavior disorders were associated with neural dysfunction in response to affective stimuli, particularly in medial and orbitofrontal prefrontal cortex and connected subcortical structures. Thus, individuals who persist in problem behaviors may show relatively enduring dysfunction, or at least later maturation, than normal in some brain areas associated with greater impulse control and self-regulation.

## Developmental Systems Theories

Overall, findings regarding adolescent risk for problem behaviors and for persistence and desistance of such behaviors into and across adulthood indicate the need for theoretical approaches that both integrate influences from a number of different systems (e.g., social, physiological) and are dynamic, with change being a central aspect of the model. Most contemporary theories of the development of antisocial behaviors in adolescence in particular have incorporated aspects of Bronfenbrenner's (1986) ecological model, whereby a hierarchy of four nested systems was conceptualized involving intrapersonal factors (e.g., temperament), microsystems of face-to-face interactions (e.g., daily parent-child conflict), behavioral settings (e.g., neighborhood), and macrocontextual factors such as cultural and community practices. Further, most theories have also incorporated aspects of lifespan developmental frameworks, which emphasize the importance of transactions between an individual's prior developmental history and current social environments, as past theories have done, but within a framework sensitive to the individual's developmental stage (Cairns & Cairns, 1995; Caspi & Elder, 1988; Hetherington & Baltes, 1988; Magnusson & Torestad, 1993; Rutter, 1989).

Overton (2013) and Lerner (2012) argue that most of the prominent earlier approaches to the study of human development were reductionist, with the core conceptual issues during early childhood focused on dichotomies such as nature-nurture, continuity-discontinuity, and stability-instability. These, they noted, created mutually exclusive, either/or frameworks that set the stage for subsequent developmental periods. Indeed, as pointed out by Lerner (2012), in earlier years "Psychologists had neither sufficient conceptual tools nor methodological means to gather and to interrelate variables from the multiple levels of analysis needed to describe the individual <- -> context relations involved in human development" (p. 31).

In contrast, recent theories are fundamentally different in taking longer-term developmental perspectives and considering their task to be one of explaining "the big picture" as it evolves across time. For example, both Lerner (2012) and Overton (2013) propose relational developmental systems models that emphasize that change across life occurs through

*mutually regulative associations* between individuals and their contexts, and focuses on the *plasticity* of behaviors and lifespan change. Findings from such models are highly informative for the development of prevention programs because they focus on factors related to behavioral change as well as to behavioral continuity within individuals across time. As discussed by Lerner, these models emphasize the importance of time and place in shaping the life course (Bronfenbrenner, 2005; Elder, 1998). This paradigm shift in the conceptualization of developmental theories is likely partially attributable to the advances in the theory-methods interface, which have enabled researchers to empirically test the plausibility of complex developmental theories (cf. Molenaar et al., 2014). For example, the development of intraindividual and interindividual nonlinear analytic methods have enabled researchers to test nonadditive interactions, which are more akin to the relational developmental systems approach in which, for example, “genes and environment do not constitute discrete pure forms and, as a consequence, behavior cannot be considered to be the additive accumulation of a number of independent factors” (p. 259, Overton, 2011).

## Dynamic Developmental Systems Theory

Similar to the Lerner and Overton model, the DDS model (Capaldi et al., 2005; Capaldi & Wiesner, 2009) is an extension of lifespan and ecological models, and further articulates both developmental and social influence processes. Because of the strong evidence that physiological systems are related to aggression and associated behaviors, it is critical that theoretical models encompass physiological systems within broader frameworks, which include psychological systems as well as social and physical environmental systems. As stated by Ramirez (2003), “The most important general insight of recent years has been perhaps the recognition that life experience can shape brain chemistry in significant ways, and that experience and neurophysiology form a seamless web” (pp. 622–623).

In addition to the importance of development and ongoing dynamic transactions between systems and elements of systems, key aspects of the DDS model include (a) time and (b) general versus outcome-specific risks (e.g., Washburn & Capaldi, 2014). Regarding time, the model considers both the importance of developmental time, which is not identical with age (e.g., adolescents go through puberty on differing timetables), as well as the importance of real time and more specifically the duration of situations or events. Granic, Dishion, Hollenstein, and Patterson (2003) have discussed the importance of the interplay of interdependent time scales within dynamic systems theory. In the physiological realm, duration of a phenomenon, and particularly the length of exposure, is critical to outcomes. For example, at the tissue/organ level, cells respond to stress in a temporal way. At first the cell tries to compensate for the stress being experienced by continuously repairing any damage caused, for example, by repairing altered proteins and even entire organelles. If these responses are unable to maintain cell viability, the cell can enter a senescent state and await removal of the stress condition. Finally, after attempts to survive are not working, and the stress event continues (e.g. starvation, adverse reactions to drugs), the cell initiates a process in which it dies in an orderly process that does not release components that would induce inflammation and an immune response (Lodish et al., 2012).

In the social realm, time and duration also can have effects on behavior in a number of ways. For example, the duration of a conflict or aversive interchange has an effect on the behavior of family members and is related to more negative outcomes (Patterson, 1982). At a more macro level, in the OYS, the developmental timing of first fatherhood impacted both the magnitude of initial behavior change and the rate of change or cumulative change in antisocial behaviors in real time (Kerr et al., 2011). The length of social relationships has also been found to affect behavior. For example, the length of the couple relationships of OYS men was found to be related to higher levels of intimate partner violence during late adolescence and early adulthood (Capaldi & Crosby, 1997).

Regarding duration of exposure to risk exposure in the social realm, Washburn, Capaldi, Kim, and Feingold (2014) examined time-varying associations of peer and partner influences on both alcohol and marijuana use for men in OYS from ages 23 to 32 years. Predictors included peer and partner alcohol and marijuana use, as well as exposure, assessed by time spent with peers and partners. Findings indicated that outcome-specific substance use of peers and partners was significantly associated with aspects of alcohol and marijuana use in men's early adulthood, with robust effects of peer substance use through age 30 years and with time spent with peers influencing alcohol use. Time with partner was protective against marijuana use unless the partner used marijuana. Thus, exposure time as well as system or outcome-specific risk were found to play a role in persistence and desistance trends in alcohol and marijuana use across early adulthood for men. In addition, it is interesting to note that while time spent with peers influenced OYS men's alcohol use, it was time spent with partners that influenced their marijuana use, highlighting that increased risk of substance use due to exposure can vary across social networks and types of substances.

Consideration of influences from general risk factors (e.g., stress in the physiological realm, low socioeconomic status in the social realm) versus risk factors more specific to a particular system or behavioral outcome (e.g., partner violence as an outcome-specific risk factor for intimate partner violence) is another key aspect of the DDS model. Although the notions of general versus specific risks are not new in the developmental area, they have been less considered within a systems perspective and have rarely been examined explicitly when testing theoretical models. Capaldi and colleagues have examined models involving contributions of both general-risk pathways and outcome-specific risk for a number of problem behaviors. For example, Washburn and Capaldi (2014) examined both in relation to heterogeneity in patterns of marijuana use for men in the OYS across their 20s. They found that both the general adolescent risk factor of poorer parental monitoring and the outcome-specific risk factor of parental marijuana use predicted membership in a chronic-use class versus a little-or-no-use class. Considering risk factors as general risk or system-specific risk can aid in developmental and conceptual clarity when considering the etiology of problem behaviors. Issues related to system or outcome-specific effects versus more general risk effects warrant future consideration.



## Discussion

The evolution of theories of problem behaviors across the lifespan to be focused on developmental change versus stability, as well as to consider the interplay of influences from multiple systems, has a number of implications for preventive approaches. Within the DDS model, for example, antisocial behavior patterns are considered to be one result of ongoing interactions between the physiological, psychological, and social systems relevant to an individual. Certainly, ongoing social interactions between a youth and his or her parents, other family members, friends, romantic partner(s), teachers, and later his or her children are considered to be a driving force, and critically for prevention, such exchanges are potential malleable. However, preventive interventions should also take into account the developmental stage and trajectory of key factors within each of the interacting systems. Below, we review some examples of successful and unsuccessful prevention programs in relation to these issues.

At the elementary school level, a strong preventive intervention is the Good Behavior Game, which has shown both proximal and long-term impacts on a number of problem behaviors including antisocial behavior, sexual risk behaviors, and substance use (Furr-Holden, Ialongo, Anthony, Petras, & Kellam, 2004; Ialongo, Poduska, Werthamer, & Kellam, 2001; Ialongo et al., 1999; Kellam et al., 2014). This classroom-wide program involves teachers in reinforcing the inhibition of rule-breaking (or conduct-problem) behavior as well as children working together to succeed. Much of the observed effectiveness of this program is due to reducing the frequency of such behaviors in the children having the most difficulty in this area, and moving them onto a more normative downward trajectory (Gilliom & Shaw, 2004). Such improvements can lead to cascading positive effects such as acceptance by prosocial peers, less involvement with deviant peers, improved school performance, and child behavior at home that is easier for the parents to manage. A likely key to the success of this intervention is improving children's inhibitory control early in their school years, at a developmentally critical time, and at a time when many children are still having problems with such control. In involving the whole classroom, the intervention was well targeted both intra-individually and contextually, addressing key social influences from peers.

At the family level, behavioral interventions designed for very young children who have experienced trauma affecting their stress reactivity have been shown to have beneficial effects partly by altering hypothalamic-pituitary-adrenal (HPA) axis function such that it has a more normative diurnal pattern (Fisher, Gunnar, Dozier, Bruce, & Pears, 2006). Children who experience physical parental neglect or physical or sexual abuse and are placed in foster care are at long-term risk for behavior problems and other negative outcomes (Osgood, Foster, & Courtney, 2010). Several studies with fostered infants and toddlers (Dozier, Manni, et al., 2006) and with fostered preschoolers (Fisher, Burraston, & Pears, 2005) have found atypical diurnal patterns of cortisol production at baseline. Interventions based in developmental theory have been designed to address this and other problems, with Dozier and colleagues (Dozier, Peloso, et al., 2006), for example, focusing on attachment including sensitive caregiver responding and biobehavioral catch-up efforts, and Fisher and colleagues focusing on multidimensional aspects of care in homes with foster parents who were specially trained to respond contingently to positive and negative behaviors of a preschooler.

In both interventions, it was expected that the negative effects of early stress on the HPA axis would be ameliorated, leading to improvements in psychosocial functioning. As expected, these developmentally appropriate interventions designed to move development of context and physiology to a more normative trajectory were found to help normalize HPA axis function and improve behavioral function. Thus, they demonstrated not only the importance of a focus on developmental stage in interventions, but the interplay between systems—in this case the associations among caregiving, physiological function, and behavior in early childhood.

Another valuable family level intervention program that is both developmentally appropriate and addresses multiple systems is early childhood home visitation (e.g., Olds et al., 1998). The Olds model, in particular, aims to change maternal risk behaviors and risky environmental contexts before and after the birth of a child to high-risk mothers and, over the long run, has been found to decrease child antisocial behavior problems, including violence, as well as related problem behaviors including substance use (Olds et al., 1998). This intervention is focused on multiple factors affecting the child, including improving maternal well-being (family planning, employment), reducing maternal risk behaviors that may be detrimental to the infant (e.g., smoking, nutrition, social interaction), and increasing adequate care of the child. Such a multiple system approach fits well within a DDS framework.

Regarding less promising interventions, findings regarding the deleterious effect of deviant peer influences at adolescence, in particular, indicate that this should be a critical consideration when designing preventive or treatment programs in adolescence. Despite this, many adolescent interventions have involved delivery to groups of higher antisocial or substance using youth, and at times have found that the positive effects of interventionist or parental influences have been negated by the negative effects of peer influences, such that the programs overall had iatrogenic effects, with the youth-focused intervention groups showing worse outcomes than both parent-focused and control groups (Dishion, McCord, & Poulin, 1999; Dishion, Poulin, & Burraston, 2001). Such programs may be not adequately considering the immaturity of the adolescent brain regarding inhibitory control, particularly in the presence of peers (Chein et al., 2011), and are thus overestimating the influence of the adults involved in the program and underestimating the power of peer influences.

A clear problem facing the field is how to deliver developmentally timed and sensitive interventions that address multiple systems at a population level, so that the chance is increased that youth and families in need of prevention and intervention programs actually receive them. Beginning before birth, ensuring access means not only working in public welfare and health, community health, and other public and private medical institutions, but also with specific cultural groups and entities (e.g., religious and tribal institutions) and broadcasting information on a wider scale via numerous media—including the internet and related social venues, radio, and television. As children grow, ensuring access involves working in preschools and later elementary, middle, and high schools and then trade schools, community colleges, and universities (Pears, Kim, Fisher, & Yoerger, 2013). It also involves working in the child welfare, juvenile justice, and criminal justice systems (Chamberlain, Leve, & DeGarmo, 2007; Eddy, Martinez, & Burraston, 2013; Shortt, Eddy, Sheeber, &

Davis, 2014), and working through the institutions that are relevant not only to family formation (e.g., agencies and medical services related to births) but also to family breakdown (e.g., divorce courts, legal and mediational services). Most importantly, reaching the population at large involves working in multiple settings simultaneously and in a coordinated fashion (Forgatch & DeGarmo, 2011).

An example of an intervention that has taken a broad-scale approach such as this to youth problem behaviors and violence is Triple P (Sanders, Markie-Dadds, Turner, & Ralph, 2004). Triple P utilizes a public awareness campaign delivered through multiple media outlets and follows this with the provision of an array of services, tailored to the varying needs of youth and their families, including preventive interventions, limited problem-focused interventions, and more comprehensive clinical interventions. An emerging literature on Triple P suggests positive impacts not only on youth (Sanders et al., 2004) but also on adult violence, such as child maltreatment (Prinz, Sanders, Shapiro, Whitaker, & Lutzker, 2009). There is a great need for the development and testing of a range of multimodal, multisetting interventions that are designed to target violence against self and others in subpopulations that are at high risk. In this regard, there are few interventions that have been developed that consider the specific needs of a population and then are designed to be culturally competent for that population.

To improve further the effectiveness of preventive efforts, the future of research on the etiology, course, and prevention of violence should involve studies that seek to understand processes over time within the multiple systems identified within the DDS and similar models. Of particular importance are investigations into the nature and influence of transactions across systems (e.g., across temperament and parenting in early childhood; across brain development and problem behaviors in adolescence and early adulthood; across substance addiction, stress, and relationship systems in adulthood). Both experimental studies and longitudinal cohort and family studies are needed to inform the field, but within these a focus is needed on attempting to understand the associations among different forms of violence and other problem behaviors both within particular points in time and contexts and across the life course.

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