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Series: Study Group on the Transitions between Juvenile Delinquency  
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Series: Study Group on the Transitions Between Juvenile Delinquency and  
Adult Crime

BULLETIN 3: EXPLANATIONS FOR OFFENDING

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The transition from adolescence to adulthood is one of the most important stages of the life course. Rindfuss, Swicegood, and Rosenfeld (1987) have referred to it as a “demographically dense” period because it involves transitions on major life course trajectories, including education, work, residence, family formation, and parenthood. The timing and success of these transitions has important consequences for the long-term development both of the individual and his or her family (Elder, 1997).

The transition from adolescence to adulthood also has been described as a window of opportunity or vulnerability when developmental and contextual changes converge to support positive turnarounds and redirections (Masten, Long, Kuo, McCormick, & Desjardins, 2009; Masten, Obradović, & Burt, 2006). The transition years also are a criminological crossroads, as major changes in criminal careers often occur at these ages as well. For some who began their criminal careers during adolescence, offending continues and escalates; for others involvement in crime wanes; and yet others only begin serious involvement in crime at these ages.

There are distinctive patterns of offending that emerge during the transition from adolescence to adulthood. One shows a rise of offending in adolescence and the persistence of high crime rates into adulthood; a second reflects the overall age-crime curve pattern of increasing offending in adolescence followed by decreases during the transition years; and the third group shows a late onset of offending relative to the age-crime curve. Developmental theories of offending ought to be able to explain these markedly different trajectories.

Theoretical perspectives have been put forward to explain patterns of offending over the life course and, in particular, during the transition from adolescence to adulthood. The following is an overview of five broad theoretical perspectives that currently inform the field's understanding of these patterns of offending: (1) static or population heterogeneity models, (2) dynamic or state dependence models, (3) social psychological theories, (4) the developmental psychopathology perspective, and (5) the biopsychosocial perspective.

### **Static Theories**

Static or population heterogeneity models view human development “as a process of maturational unfolding” in which behavior, including criminal behavior, emerges in a uniform sequence contingent upon age so that patterns of behavioral change unfold at roughly the same ages for all individuals (Dannefer, 1984). There are three defining aspects of static theories of crime. First, the basic causes of criminal behavior and of changes in offending over time, i.e. individual endowments, are established relatively early in the life course. Second, these early endowments create interindividual (or

relative) stability in the behavior. That is, across the life course individuals are generally expected to maintain their position, relative to other individuals, with respect to their levels of offending. Third, changing absolute levels of offending are a product of maturational unfolding, that is, normative changes in the behavior that naturally occur as individuals age.

In Gottfredson and Hirschi's (1990) self-control theory the propensity to engage in crime is viewed as a product of the person's level of self-control, which is established roughly by age 8 (Hirschi & Gottfredson, 2001). This propensity is thought to be “stable through life, and consequently is unaffected by events that occur in life” (Warr, 2002, p. 99). Youth who are exposed to effective parenting styles at early ages and who have positive relations with their parents are likely to have high levels of self-control and therefore relatively low rates of offending at all ages. In contrast, youth who experience poor parenting and have harsh, brittle relationships with their parents are likely to have low levels of self-control and therefore relatively high levels of offending at all ages.

Typological theories identify two major groups of offenders, early-starters (Patterson et al., 1991) or life-course persistent offenders (Moffitt, 1993), and late-starters (Patterson et al., 1991) or adolescence-limited offenders (Moffitt, 1993). The life-course persistent group, which is relatively small, tends to have a childhood onset of offending. According to Patterson and colleagues, this is largely due to ineffective parenting styles and coercive exchanges in distressed families. In Moffitt's theory, early onset is primarily due to the interplay between individual deficits, especially neuropsychological deficits, and ineffective parenting styles. In both theories, early problems set the stage for high levels of continuity in offending across the life course. In contrast, late starters have an

onset of offending during the adolescent years and delinquent careers that tend to be relatively short. For this group, both theories focus on challenges associated with adolescent development -- such as association with delinquent peers, failure in school, and the difficulty in adjusting to the “maturity gap” -- to explain involvement in delinquency. The “maturity gap” refers to the gap between things that adolescents want (such as sex, money, and cars) and things that they can actually obtain.

These theories’ basic premises provide a set of expectations about changing patterns of offending during the transition years from adolescence to adulthood. With respect to persistence, in Gottfredson and Hirschi's (1990) theory, individuals with low levels of self-control are expected to have relatively high levels of offending at all ages. Their self-control issues cause high levels of offending during adolescence, and the general stability of self-control over the life course increases the likelihood of that they will continue offending in the adult years.

The typological theories offer a somewhat different explanation for persistence. For example, Moffitt's model theorizes that persistence is caused by two general developmental processes. The first, contemporary continuity, refers to the relatively strong continuity in the original causes, “such as high activity level, irritability, poor self-control, and low cognitive ability” (Moffitt, 1993). As these individual deficits persist, they lead to persistently high levels of offending. The second process, cumulative continuity, refers to the consequences of earlier antisocial behavior such as isolation in delinquent peer groups, school failure, and ultimately difficulty in the transition to adult roles, such as failure to finish school, teen parenthood, and unemployment. These consequences of earlier offending make it difficult for the individual to escape

involvement in antisocial behavior and increase the persistence of delinquent careers.

Although the processes that account for persistence differ somewhat between self-control theory and the typological theories, all these theories share one central feature: persistence is almost entirely associated with an early onset of offending. That is, those who start offending at relatively young ages, primarily during childhood, are likely to maintain their relatively high levels of offending during the transition from adolescence to adulthood and beyond.

In the typological theories, desistance is primarily associated with the other, numerically larger group of adolescence-limited offenders. Their offending typically starts during early adolescence, and they are likely to desist from offending by early adulthood. For Moffitt, for example, their offending is largely a product of the gap between the onset of sexual and physical maturity and the onset of social maturity or adult roles and privileges in advanced industrial societies. Given that all adolescents have to confront this gap to some degree, peer influences may contribute a strong motivating influence for delinquency. However, when the frustration associated with the maturity gap wanes as individuals age and can achieve their aims legitimately, the motivating forces supporting delinquency diminish considerably and desistance becomes likely. Desistance is also aided by the fact that these offenders are more apt to make successful transitions to adult roles such as partner, parent, or employee.

For Gottfredson and Hirschi, desistance is entirely a function of maturational reform, that is “change in behavior that comes with maturation” (Gottfredson & Hirschi, 1990). Glueck and Glueck presented a similar view, noting that “the biological process of maturation is the chief factor in the behavior changes of criminals” (1940, p. 104). The

age of onset and the early characteristics associated with onset are fully capable of predicting desistance. Youth with low self-control begin offending early and have difficulty escaping the lures of crime. Youth with high levels of self-control will start later (if at all) and end earlier. “Combining little or no movement from high self-control to low self-control with the fact that socialization continues to occur throughout life produces the conclusion that the proportion of the population in the potential offender pool should tend to decline as cohorts age”(Gottfredson & Hirschi, 1990). According to Gottfredson and Hirschi (1990), developmental variables, such as association with delinquent peers, gang membership, and at later ages marriage and employment exert no causal impact on the likelihood or timing of desistance; relationships between these variables and desistance are entirely spurious.

Neither the static nor typological theories of offending anticipate the presence of late onset cases as a meaningful proportion of the population. As Moffitt, Caspi, Rutter, and Silva state, the “onset of antisocial behavior after adolescence is extremely rare” (2001). The rarity or absence of late onset offending is also evident in Gottfredson and Hirschi's (1990) self-control theory. If offenders initiate offending at unusually late ages, that could only be because their high levels of self-control prevented their involvement in adolescent delinquency, but that same high level of self control would also cause them to desist very quickly should they begin. Thus, it is highly unlikely that individuals would begin a career of persistent offending later in the life course.

## **Dynamic Theories**

Dynamic or life-course developmental models adopt a sociogenetic approach, human behavior is never viewed as set or established, or inevitably flowing forth from early endowments. Sociogenesis emphasizes “the uniquely ‘open’ or ‘unfinished’ character of the human organism in relation to its environment” (Dannefer, 1984, p. 107), a plasticity that persists throughout life. Theories that adopt a developmental, life course perspective of crime do not deny the importance of early individual or parenting differences. However, their primary explanation for later offending is associated with changing social environments.

At least three general developmental processes have been identified to account for persistence during the transition years. The first stems from the stability of the causal factors that are associated with the onset of offending. Negative temperamental traits, ineffective parenting styles, poverty and structural disadvantage, school failure, and association with delinquent peers are all linked to the onset and maintenance of delinquent careers (Catalano & Hawkins, 1996; Thornberry & Krohn, 2005). In turn, each of these attributes shows some stability throughout life. For example, it is often difficult for families who experience extreme levels of poverty and structural adversity to escape that adversity and the development of adolescents raised in those families is constantly compromised. Similarly, ineffective parenting styles are often evident both in childhood and in adolescence (Patterson, Reid, & Dishion, 1992), leading to hostile, brittle relationships between parent and child during the transition years. The absence of strong social and emotional support from parents decreases the likelihood of children escaping from involvement in crime and increases the likelihood of persistence.

The second developmental process is related to the negative consequences of earlier involvement in antisocial behavior. Dynamic theories assume that involvement in delinquency disrupts later life course development, especially if it is prolonged and serious. Thornberry's (1987) interactional theory views delinquency as embedded in mutually reinforcing causal relationships. Delinquency weakens bonds to conventional people and institutions, increases subsequent involvement in delinquent peer networks and street gangs, and strengthens delinquent belief systems (see also Akers, 1998). Individuals who have weakened prosocial bonds and are enmeshed in delinquent behaviors and networks are likely to show high levels of persistence in offending.

Life-course theories also emphasize the impact of earlier offending on transitions along major life course trajectories. Delinquency disrupts the successful completion of the developmental challenges of adolescence. Delinquents are likely to become alienated from parents and family, fail at school, and become enmeshed in delinquent peer groups, all factors that are related to disorderly and unsuccessful transitions to adult roles. In turn, failure to make timely and successful transitions from adolescent to adult roles reduces both human capital (e.g., competences, knowledge, and personality attributes) and social capital (connections within and between human and social networks) and increases the likelihood of persistent involvement in offending.

A third general process is related to involvement in the juvenile justice system (Bernburg & Krohn, 2003; Paternoster & Iovanni, 1989; Sampson & Laub, 1997). Official labeling (records of arrest and incarceration) increases embeddedness in criminal social networks, which increases persistence in offending (Bernburg, Krohn, & Rivera, 2006). Similarly, official labels increase the likelihood of school dropout and unstable

employment, both of which are associated with increased persistence in offending (Bernburg & Krohn, 2003).

Overall, developmental, life course theories point to at least three processes that are associated with persistence in offending from adolescence to adulthood: the stability of earlier deficits, the life-course consequences of delinquency, and official labeling. Thus, persistence is not primarily an outcome of early endowments as it is in static theories. In dynamic theories, persistence is primarily an outcome of more proximal developmental processes that were often set in motion by earlier developmental issues, including earlier involvement in delinquent behavior.

In dynamic theories, desistance is largely explained by the re-establishment of bonds to conventional society (Sampson & Laub, 1993; Thornberry, 1987) and by concordant changes in the individual's social networks (Warr, 1998). Desistance is more likely to occur when the causal factors that created delinquency in the first place "are less numerous, less extreme, and less intertwined" (Thornberry & Krohn, 2005), but it is not predetermined by age of onset. Offenders who increase attachment to conventional others and commitment to prosocial activities such as school and work are more likely to escape persistent involvement in criminal behavior: "a cascade of successful relationships and acceptance by conventional people can result in stronger social bonds, and this process can, in turn, lessen the propensity for crime" (Cohen & Vila, 1996).

In Farrington's theory, desistance is related to "changes in socialization influences (decreasing importance of peers, increasing importance of the female partners and children), and life events such as getting married, having children, moving home and getting a steady job" (Farrington, 2003, p. 235). Sampson and Laub's social control

theory (1993) emphasizes the importance of adult social bonds such as marital attachments in accounting for desistance during the transition years. Part of this effect is direct; a “quality” marriage increases attachment to others, thereby increasing social control and reducing offending. But part of this effect is indirect; marriage alters the nature of routine activities (Horney, Osgood, & Marshall, 1995), for example, by reducing time spent in bars and with delinquent peer networks (Warr, 1998).

Relatively little theoretical attention has been paid to late onset offending in these dynamic models. Thornberry and Krohn (2005) hypothesize that the late onset offenders are unlikely to have the multiple causal factors in their backgrounds that are associated with early onset offending. They are, however, likely to have less human capital -- for example, lower intelligence and academic competence and fewer social skills -- than other adolescents (Nagin, Farrington, & Moffitt, 1995). At earlier ages they are protected from the effects of these deficits by strong social bonds. The family is hypothesized to provide a supportive environment in part because of their more advantageous structural position; family resources and attachments (Mannheim, 1967) provide both social control and social support to constrain behavior. During early adulthood, however, individuals begin to leave the protective family and school environments so that deficits in human capital become a serious impediment against acquiring meaningful employment and establishing stable partner relationships. The difficulty experienced during the transition years also makes late onset offenders more vulnerable to the influence of deviant friends and to the consequences of alcohol and drug use.

### **Social Psychological Theories**

A social psychological perspective focuses on subjective aspects of life experiences as the key to understanding behavioral continuity and change. These experiences include cognitive and emotional processes, issues of identity, and human agency (the capacity for individuals to make choices).

Although some theoretical formulations focus on subjective processes that appear to be fixed (e.g. the notion that stable traits foster world views or emotional responses that continuously increase the propensity for crime), more often social psychological perspectives emphasize these processes' malleability. Accordingly, these theories have been used to explain changes over the life course in the individual's level of involvement in criminal activity. Life course theories that focus on the impact of a small set of transition events (e.g., the "good marriage effect") place most conceptual attention on the change agents' actions. For example, the spouse has an important role in structuring the individual's routine activities, "knifing off" relationships with bad companions and monitoring the partner's actions (Laub & Sampson, 2003). In contrast, social psychological theories, especially theories of symbolic interaction (Mead, 1934), thrust the actor and actor-based changes into the foreground (Matsueda & Heimer, 1997; Giordano, Schroeder, & Cernkovich, 2007; Maruna, 2001). Although social psychological theories to a greater extent explore individual-level changes, they nevertheless focus heavily on the reciprocal relationship between the actor and the environment.

The concept of "hostile attributional bias" provides one example of a cognitive process theorized to result in continuity in aggressive behavior. Dodge, Price, Bachorowski, and Newman (1990) argue that more aggressive individuals are more likely

than their non-aggressive counterparts to possess a particular type of social information processing deficit that results in a tendency to over-attribute negative intentions to others, even in ambiguous situations. This trait emerges early and, as it is an individual difference, it may be linked to a lifelong pattern of aggressive actions.

Sociologically oriented social psychological theories have focused more attention on life course changes in crime, especially desistance, although these theories can be extended to understand late onset or more episodic patterns of offending and even continuity or persistence. Giordano, Cernkovich, and Rudolph (2002) developed a “theory of cognitive transformation” that focused attention on cognitive shifts that precede, accompany, and follow desistance from crime. Many scholars have noted that a basic motivation to change is a first step in affecting sustained behavior change, but Giordano et al. (2002) emphasize that individuals also vary in their openness and receptivity to particular catalysts or “hooks for change.” For example, faith-based interventions with offenders are common in prison settings, but some individuals will be more receptive to these efforts than others, and this may also be the case for the same individual at different points in life. Social psychological perspectives emphasize that these hooks for change are important not only as sources of social control, but also because they foster new definitions of the situation (attitudes), a blueprint for how to succeed as a changed individual, and a satisfying and achievable replacement self (see also Maruna, 2001; Matsueda & Heimer, 1997). A final cognitive shift involves a redefinition of one’s former criminal actions as no longer desirable and fundamentally incompatible with one’s new identity.

It is useful to distinguish subjective changes that can be tied to particular transition events from those that appear to unfold somewhat independently of these role transitions. For example, a prosocial spouse may well foster more negative attitudes about the desirability of affiliating with certain friends, yet decreased susceptibility to peer pressure is a broader phenomenon in the transition from adolescence to young adulthood and is implicated in the declines in criminal activity that typically occur across this transition (Giordano, Cernkovich, & Rudolph, 2002; Thornberry, 1987). Giordano, Schroeder, and Cernkovich (2007) also focused on emotional changes, suggesting that an exclusive focus on cognitive processes does not provide a comprehensive treatment of criminal continuity and change (Agnew, 1997). The adolescent to adult transition may result in a diminution of the negative emotions originally connected to criminal behavior (e.g., as engendered by conflict with parents), a diminution of positive emotions connected to crime (e.g. what was once a source of thrills and excitement begins to lose its luster; see Shover, 1996; Steffensmeier & Ulmer, 2005), and increased ability to regulate or manage the emotions in socially acceptable ways.

Emotions are also implicated in changes that are more directly related to particular transitions such as marriage. Emotions can be seen as providing energy or valence to new lines of action (Collins, 2004; Frijda, 2002). Thus, while an ongoing marriage provides a measure of social control over individual conduct, the initial move in the direction of this prosocial terrain is not well explained, or is attributed to chance or luck (Laub, Nagin & Sampson, 1998). The positive emotions that connect to a new love relationship are, however, available early on and may contribute to the actor's motivation to embark on a self-improvement project. Emotional processes and transformations are

also likely to be integral to the success of other catalysts for change. For example, although spiritual transformations are associated with new attitudes and behaviors, Pargament (1997) notes that emotions are also central to the conversion process and, for some offenders, spiritual transformations have proven an effective vehicle for emotion coping (see Terry, 2003).

Persisters believe that they are stuck in their current circumstances. Desisters have more positive, agentic world views, including feelings of pride. As a result, desisters have been able to put considerable distance between their old criminal self and the one they have crafted around the process of “making good.” More recently, Maruna and Mann (2006) extended this notion, suggesting that the tendency within criminal justice and other therapeutic environments to require offenders to take full responsibility for their actions may be misguided, and not necessarily a positive step in the desistance process. Instead, offenders’ beliefs that their negative behavior resulted from particular external factors may facilitate the process of distancing themselves from these actions and carving out more productive future goals and actions (see also Mischkowitz, 1994; Vaughan, 2007).

Rational choice theories also focus on subjective, social psychological processes. For example, Shover (1996) theorizes that over time the offender recalibrates the costs and benefits of crime, and many changes in perspective (e.g., an increased reluctance to participate in the riskier and more dangerous forms of crime, such as robbery, and increased awareness of time as a diminishing resource) do not fundamentally depend on external catalysts such as a spouse.

Although the above perspectives on desistance vary in emphasis, all tend to highlight the distinctively human capacity for reflection and ability to develop a future plan that diverges from prior habitual actions (Mead, 1934). Thus, human agency is a key concept for social psychological treatments of the desistance process. As Emirbayer and Goodwin (1994) suggest, the individual has an important role in creating the very networks that influence them.

Although most researchers who are interested in social psychological factors have focused on desistance processes, subjective processes may also be implicated in the late onset offending. For example, disadvantaged youth may focus heavily on lofty occupational aspirations (e.g., becoming a pro-football player) that in the long run prove to be unattainable. For adults with more adult needs and responsibilities, however, feelings of demoralization and even anger about these circumstances and changing attitudes (cognitions) can support movement into illegal activities or drug use (MacLeod, 1995; Zhang, Loeber, & Stouthamer-Loeber, 1997).

The notion of human agency may be implicated in late onset processes. For example, individuals can choose the social networks and behaviors that they pursue. These actions' meanings, however, change as individuals mature, and adulthood provides more "degrees of freedom" than adolescence. For example, the youth who is protected by a restrictive family in adolescence may later gravitate toward delinquent companions or take advantage of illegal opportunities. Theoretically, this could be conceptualized as simply a reduction in social control, yet more than this absence of social control is required since other individuals are likely to turn away from the wild party or street life even when opportunities for involvement are presented. Actions may be identity-relevant,

that is, they support one's view of oneself. However, this identity is constantly evolving and the individual has agency with respect to moving toward, as well as away from, different identities.

A social psychological approach to late onset also includes a role for emotional processes. While the idea of accumulated feelings of demoralization conveys the notion of a gradual erosion of early "protective" factors, adult relationships and situations may be associated with strong emotional experiences that result in a late onset of some forms of antisocial behavior (e.g., a couple's escalating conflicts that result in eventual violence, or involvement in heavy drinking or drug use). Intimate partner violence is associated with longer duration relationships, cohabitation (Brown & Bulanda, 2008), and other dimensions of relationship "seriousness," all of which are more typical of young adult than adolescent dating patterns (Giordano, Flanigan, Manning, & Longmore, 2009).

Social psychological perspectives also offer an explanation for episodic or intermittent patterns of offending that are common in long-term follow-up studies of delinquent youths (see e.g., Bushway et al., 2001). However, these represent embarrassing negative cases for extant theories of desistance, particularly when acts are committed by those who have developed strong bonds or have clearly expressed a strong commitment to turning their lives around (a cognitive transformation). However, a focus on emotional processes provides one conceptual bridge between these broader life course trends and situated actions that are associated with specific "derailment" reoffending experiences.

Although it is traditional to focus on aspects of identity that correspond to major roles (e.g., family man, good mother, reliable worker), it is also useful to consider that the

individual possesses an emotional self that is constantly evolving along with these other identity statuses. Although influenced by the latter, the emotional self exists somewhat independent of them (Engdahl, 2004; Lupton, 1998). Symbolic interaction theories also stress that past selves are never completely discarded (Mattley, 2002). Thus, when confronted with stressful or trying circumstances, some individuals may draw on earlier forms of emotion-coping (e.g., violence, drug/alcohol use). In conclusion, emotions and cognitions are intimately related.

### **Developmental Psychopathology**

Developmental psychopathology is an integrative framework that brings together ideas from the sciences of human development, general systems theory, clinical psychology, psychiatry, sociology, pediatrics, neuroscience, behavior genetics, and other disciplines concerned with good and poor adaptation over the life course (Cicchetti, 2006; Masten, 2006; Sroufe, 2007). In this perspective, early experiences can be carried forward, while at the same time the possibility of change continues throughout the lifespan. The developmental psychopathology perspective also underscores the possibility of concentrated windows of opportunity or vulnerability when change and turning points are more likely, including the transition to adulthood period.

This framework emphasizes the role of development for understanding, preventing, and treating problems of human behavior or adaptation (Cicchetti, 2006; Masten, 2006; Sroufe, 2007). At the heart of this perspective is the view that development is a dynamic process emerging from complex interactions and co-actions over time involving genes and many interdependent systems from the cellular to the

social and societal levels.

Many interactions are involved in development across the multiple levels of genes, the developing organism, and experience. No two individuals will be alike because even identical twins with the same genetic make-up will have different experiences. Any individual will have the potential to develop in multiple directions, depending on experiences and their timing, as well as chance events, while individuals with disparate beginnings also have the potential to develop in similar directions as a result of life experiences.

In developmental theory, the early onset of problems often indicates either serious problems in the early caregiving environment (e.g., maltreatment, neglect, malnutrition, inconsistent care, exposure to toxicants), a non-normal organism (e.g., a genetic abnormality), or some combination of vulnerability or sensitivity and negative experiences. Genetic polymorphisms that may moderate the impact of negative experiences on development, and broadly there is an interplay of genes and experience in shaping development (Rutter, Moffitt, & Caspi, 2006). Additionally, it is possible that negative early experiences can become biologically embedded in a child, who then carries forward a vulnerability in the form of altered brain development or stress reactivity (Obradović & Boyce, 2009). High levels of stress with poor parenting, for example, could result in dysregulation of stress response systems and altered brain development leading to poor executive functioning skills, such as high reactivity and poor impulse control. As a result, such children are more likely to be rejected by prosocial peers, do poorly in school, and fall in with deviant peers.

Evidence is also growing that early self-control and antisocial behaviors may

initiate a cascade of subsequent problems over time and contexts (Burt & Roisman, in press; Masten et al., 2005; Obradović, Burt, & Masten, 2010). Early antisocial behavior, in effect, spreads to other domains of function over time, yielding numerous indirect consequences. Cascade effects explain in part why early prevention programs, which often target or alter aggressive, disruptive, impulsive and inattentive behavior, have such a high rate of return on investment (Heckman, 2006).

In developmental psychopathology, it also has been noted that there are general windows of “vulnerability and opportunity” when the likelihood of change increases (Dahl & Spear, 2004; Masten et al., 2006; Steinberg et al., 2006). Some windows of change may open as a result of development (e.g., puberty) or contextual transitions (e.g., entering or leaving school, leaving home), although some appear to reflect a confluence of developmental and contextual changes.

Early adolescence is widely viewed as a vulnerability window for multiple forms of problems and disorders when developmental changes and contextual challenges converge to accelerate problems such as risk taking behavior, depression, and delinquency, particularly when parenting quality is poor (Dahl & Spear, 2004; Masten, 2007; Steinberg et al., 2006). Adolescence represents a maturity gap not only because of the interval between sexual maturation and adult social roles, but because of a gap in developmental systems related to motivation, self-control, and brain development. There is a maturational gap in the timing of “go” systems in the brain that motivate sensation seeking and risky behavior, maturing in early adolescence as a result of puberty, and the “stop and think” systems of the prefrontal cortex, which mature much later in early adulthood. This gap results in a period of vulnerability that has been described as

“starting the engines without a skilled driver” (Steinberg et al., 2006).

The transition to adulthood also is a period of concentrated change, when young people are leaving home and striking out on their own. For young people with little or no family support and poor prospects for work or higher education, this can be another time of great challenge and vulnerability. Youth aging out of foster care, or emancipated early due to family conflict, for example, may face the challenges of this transition with little support.

The transition to adulthood, however, often appears to be a window of opportunity, when development and context converge to support positive change, including desistance from criminal behavior (Masten, 2007; Masten et al., 2006). It is probably not a coincidence that longitudinal studies of resilience have observed a pattern of development in which individuals turn their lives in a dramatically positive direction or “stage a recovery” during this window (Masten et al., 2006). For most individuals, brain development in this period indicates growing capabilities for planning and taking action on those plans, as well as more reflective decision-making. During this period, young people are gaining cognitive capacity from the myelination and functional maturation of the prefrontal cortex. Concomitantly, expectations are also increasing for mature behavior and the consequences of offending become more serious with adult legal status. Romantic relationships are maturing in ways that may foster law-abiding behavior. As a result of these developments, the capacity for change increases along with the motivation and opportunities to move toward desirable adult roles.

Normative growth in the potential and opportunities for change does not, of course, assure desirable change. The brain may be “hijacked” by drug addiction, college

culture conducive to binge drinking, recruitment by an anti-social or anti-society organization (there are dangerous “mentors”), and discrimination leading a young person away from mainstream goals. Others are cut off from societal opportunities because of lingering consequences of earlier missteps (e.g., school dropout or a criminal record). Some young people also may simply be unlucky in that the consequences of their behavior alter their opportunities or potential (e.g., a person unintentionally becomes pregnant or is injured in an accident). A combination of these factors could increase the probability of persistent involvement in offending for some, or late onset of offending for others.

### **The Biopsychosocial Model**

The biopsychosocial perspective regards aggressive behavior as a result of interacting mechanisms at biological, psychological, interpersonal and environmental levels. Determinants from all levels are regarded as dimensional, gradual, and dynamic. As a multilevel approach, this model argues that a single level explanatory framework is probably insufficient.

To begin, neural development during early childhood is characterized by massive changes that support the development of mature regulation of emotion and behavior. Early neural development is characterized by an initial exuberant increase in synaptic connections followed by pruning and synaptic elimination that improve the efficiency of brain connectivity (Huttenlocher, 1979; Huttenlocher, 1990; Ramakers, 2005). Anatomic neuroimaging studies provide evidence of these dramatic maturational changes that highlight differences in the developmental trajectories across brain regions. In particular,

frontal regions involved in executive functioning and attentional processes mature later than regions involved in more basic functions such as motor or sensory cortex.

Age-related changes in brain activity accompany anatomic shifts across development in white, cortical gray and frontal gray matter (Giedd et al., 1999; Shaw et al., 2008). Functional magnetic resonance imaging (fMRI) studies suggest that cortical functional development is characterized by a shift from diffuse to focal cortical responses when performing tasks requiring attentional control (Casey et al., 1997; Bunge et al., 2002; Durston et al., 2006; Tamm et al., 2002). A similar pattern of more diffuse local functional connectivity has been documented in examinations of spontaneous fluctuations of hemodynamic activity (Fair et al., 2008; Fair et al., 2009; Kelly et al., 2009; Supekar et al., 2009). This pattern of diffuse activation in children suggests that local functional networks are immature and inefficient while more focal activations in adults are presumed to be a consequence of synaptic elimination and improved efficiency. Brain circuits involved in cognitive control, attention, and emotion regulation are actively developing throughout late childhood and adolescence. Thus, decreases in risk behaviors and conduct problems that occur starting in mid to late adolescence are likely to be related to brain maturity and associated regulation.

With regard to externalizing problems such as aggression, studies have demonstrated altered structure of the dorsal anterior cingulate cortex and amygdala (Whittle et al., 2008; Boes et al., 2008). In a study of 117 non-referred children (ages 7-17), Boes et al. (2008) found a significant negative partial correlation between aggressive behaviors in boys, as measured by parent and teacher report, and the volume of the right anterior cingulate cortex. A study of adolescent aggression during parent-child

interactions found that amygdala volume correlated positively with the duration of aggressive behaviors, suggesting an inability to down-regulate quickly (Whittle et al., 2008). Taken together, these findings suggest that the anterior cingulate cortex may not effectively regulate amygdala activity in individuals who are genetically predisposed towards impulsivity and aggression.

Socialization depends, in part, on the child's ability to learn from reward and punishment (e.g., fear conditioning) within proper conditions (social, economic, psychological etc.). Neurobiologically based malfunctions of those learning abilities create a neurobiological base for failing socialization. For instance, in participants with early and adolescent onset forms of Conduct Disorder, fear conditioning deficits were observed (Fairchild et al., 2008). Gao et al. (2010) demonstrated that poor fear conditioning at age 3 predisposes to crime at age 23 because individuals who lack fear are less likely to avoid situations and events associated with future punishment. Several parts of the cortex and the amygdala-hippocampal complex are involved in this process of socialization and social learning, building up "morality" and the sensitivity for reward and punishment (Van Overwalle & Baetens, 2009; Schug et al., 2010).

Early in adolescence, a dramatic remodeling of the reward circuitry occurs, resulting in "go" systems in the brain that fuel sensation seeking and risky behavior as a result of puberty (Van Leijenhorst et al., 2009, 2010). A more gradual and lengthier maturation of brain systems involved in self-regulation has also been demonstrated (Steinberg, 2010). For instance, "stop and think" systems in the prefrontal cortex will not mature before early adulthood (Van Leijenhorst et al., 2009, 2010). These differences in the speed of maturation create a kind of maturational gap: reward-seeking tends to

increase between preadolescence and mid-adolescence and declines thereafter in a curvilinear pattern. The level of impulsivity, on the other hand, follows a linear pattern, declining steadily from age 10 on. The combination of relatively higher tendencies to seek reward and still maturing capacities for self-control may be responsible for the heightened vulnerability to risk-taking in middle adolescence (Steinberg, 2010).

It seems plausible that the improvement in self-control during adolescence partly underlies desistance from delinquent behavior, especially in the down slope of the age-crime curve. The maturation of impulse control and suppression of aggression are, however, also associated with other brain systems involved in the maturation of personal responsibility, resistance to peer influence, and consideration of others. The maturation of these two brain systems (the “cognitive-control” and “socio-emotional” one) may be differentially related to desistance from antisocial behavior (Monahan, Steinberg, Cauffman, & Mulvey, 2009).

As adolescence is a critical developmental period for the maturation of neurobiological processes, substance abuse also typically emerges during this stage. An imbalance between cognitive controls in the face of appetitive cues may be predictive of a greater risk for alcohol and substance dependence (Casey & Jones, 2010). Substance abuse can negatively influence the brain’s regulatory function. Diminished self-control not only increases the imbalance between the brain’s reward and regulatory functions but also decreases the threshold for criminal behavior. As substance abuse is associated with the risk of criminal behavior, it might indirectly explain to some extent late onset antisocial behavior.

Psychophysiological features are also of interest in explaining behavior during the transition from adolescence into adulthood since these features seem to be associated with aggression and criminal behavior. Low heart rate in childhood has been demonstrated to be predictive of aggression during adolescence, while high heart rate “protected” against it (Ortiz & Raine, 2004). However, whether higher heart rate and normal skin conductance can function as protective factors remains to be seen (Loeber et al., 2007).

Genetic research focuses on heritability estimates for antisocial behavior as well as on candidate genes for antisociality in interaction with the environment. Twin studies provided substantial evidence for these genetic influences on aggressive and antisocial behavior (Popma & Raine, 2006; Schug et al., 2010). Some genes seem to influence antisocial behavior across the entire lifespan, whereas others only appear to operate in adolescence or adulthood. There is some preliminary evidence that specific candidate genes are associated with adolescent-onset antisocial behavior (Burt & Mikolajewski, 2008) and also that persistence is theoretically associated with genetic approaches (Silberg et al., 2007). Undoubtedly, the expression of genes is embedded in complex gene-environment interactions, and the initiation and maintenance of aggression is influenced by factors such as the family environment and peer relationships.

### **Conclusions and future directions**

Several theoretical models offer clear, coherent explanations for offending in the transition from adolescence to adulthood and enjoy considerable empirical support. Although stable individual differences retain some importance for explaining offending

during the transition years, it appears that changing life circumstances in such areas as family formation, work, and social network affiliations are also quite important.

The theories discussed focus on broad developmental patterns to explain offending during the transition from adolescence to adulthood. For example, some theories, especially those that adopt a static orientation, focus on the impact of early characteristics on offending that occurs between the ages of 15 and 29. Dynamic theories focus on changes that occur along major life-course trajectories such as education, work, and family formation. For example, the order and timing of transitions along these trajectories are used to provide explanations for persistence and for desistance as individuals move from adolescence, through early adulthood, to the greater stability of the adult years.

Although life course criminology has made considerable progress in refining theoretical explanations, there are still many topics that require additional attention:

1. Much more is known about persistence and desistance compared to late onset offending. Late onset is an important pattern of offending, both theoretically and in terms of policy implications, and deserves more explicit theoretical attention.

2. Several researchers have pointed to intermittent patterns of offending where offenders stop for a period of time and then relapse to continue their involvement in offending. Very little attention, either theoretically or empirically, has been devoted to this pattern. Longitudinal studies should describe this pattern more precisely and theoretical models should explain what factors are associated with why offenders stop and then reinitiate offending after some period of time.

3. Criminological theories have focused more attention on explaining broad patterns of persistence versus desistance and less attention on explaining finer grained distinctions in criminal careers. For example, there are few explanations of escalation versus de-escalation (but see Le Blanc, 1997) or of the different factors associated with the decrease in offending and in the maintenance of near-zero offending in the study of desistance. Movement toward investigation of these fine-grained processes will yield more detailed understanding of offending during the transition years as well as more refined policy implications.

Current theories clearly provide helpful, even if incomplete, explanations for offending and changes in offending, especially during the transition years. The task is to build upon the considerable progress that has been made in the past quarter century.

#### *Policy and Practice*

A strong theme to emerge is the long-term negative consequences of disorderly transitions. For example, failure to complete high school and teen parenthood has important effects on the individual and his or her family. This suggests the importance of developing effective prevention programs to reduce the occurrence of these precocious transitions in the first place. Doing this will not only improve the level of educational attainment and the process of family formation in general but is also likely to have secondary effects such as reducing the prevalence and frequency of criminal offending during the early adult years. Obviously, prevention efforts will not be entirely successful. Thus, it is also vitally important to develop effective services to reduce the future negative consequences likely to befall high school dropouts and teen parents. At the same

time, the theories discussed also suggest the long-term benefits of early intervention programs.

Finally, contemporary criminology offers a full spectrum of well-developed static and dynamic theories to explain differences in trajectories of offending during the transition to adulthood. Yet the very fact of these differing trajectories calls out for theories that can account for malleability or change. While academic criminologists now take dynamic theories for granted, such accounts are only beginning to diffuse into public discourse and policy. For these latter audiences, the notion of dramatic change in offending trajectories has important, if not revolutionary, implications. To the extent that we can observe and explain malleability or change in criminal behavior during the teens and twenties, it becomes progressively more difficult to justify applying permanent or long sanctions to young offenders. Policies such as life sentences without the possibility of parole or the lifelong application of civil disabilities such as disenfranchisement assume that criminality is a fixed trait that crystallizes early in the life course and is all but immutable thereafter. Our review of criminological theory and the available empirical evidence call into question such deterministic assumptions, suggesting instead that change is common if not ubiquitous.

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