Brain Development, Social Context, and Justice Policy

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INTRODUCTION

Justice policy reform in the past decade has been driven by research evidence indicating that brain development is ongoing through adolescence, and that neurological and psychological immaturity likely contributes in important ways to teenagers' involvement in crime. But despite the power of this trend, skeptics point out that many (perhaps most) adolescents do not engage in serious criminal activity; on this basis, critics argue that normative biological and psychological factors associated with adolescence are unlikely to play the important role in juvenile offending that is posited by supporters of the reform trend. This Article explains that features associated with biological and psychological immaturity alone do not lead teenagers to engage in illegal conduct. Instead the decision to offend, like much risk-taking behavior in adolescence, is the product of dynamic interaction between the still-maturing individual and her social context. The Article probes the mechanisms through which particular tendencies and traits linked to adolescent brain development interact with environmental influences to encourage antisocial or prosocial behavior.

Brain development in adolescence is associated with reward-seeking behavior and limited future orientation. Further, as compared to adults, adolescents are particularly sensitive to external social stimuli, easily aroused emotionally, and less able to regulate strong emotions. The Article shows how these tendencies may be manifested in different teenagers in different ways, depending on many factors in the social context. By analyzing this dynamic relationship, the Article clarifies how social environment influences adolescent choices in ways that incline or deter involvement in crime and other risky behavior. Thus a teenager who lives in a high-crime neighborhood with many antisocial peers is more likely to

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get involved in criminal activity than one in a neighborhood with few such peers, even though the two may not differ in their propensities for risk-taking.

The Article's interactive model offers powerful support for laws and policies that subject adolescent offenders to more lenient sanctions than adults receive and that tailor dispositions to juveniles' developmental needs. Our examination confirms and illuminates the Supreme Court's conclusion that juvenile offenders differ in important ways from adult counterparts; juveniles deserve less punishment because their offenses are driven by biological and psychological immaturity, and also because, as legal minors, they cannot extricate themselves from social contexts (neighborhoods, schools and families) that contribute to involvement in crime. The model also confirms that correctional facilities and programs, which constitute young offenders' social settings, can support healthy development to adulthood in individual juvenile offenders, or conversely affect their lives in harmful ways.

Justice policy reform in the past decade has been driven by powerful research evidence indicating that brain development is ongoing through adolescence, and that neurological and psychological immaturity likely contributes in important ways to teenagers' involvement in crime. Courts (including the Supreme Court[1]), legislatures and agencies increasingly view juvenile offenders as different from their adult counterparts, and accept that the legal response to juvenile crime should attend to these differences. An emerging consensus holds that policies sanctioning juveniles in developmentally appropriate ways and recognizing differences between young offenders and adults will advance the criminal law goals of fairness, accountability, and crime prevention.[2]

Although lawmakers and the public increasingly accept the argument for developmentally-based justice policies, some skepticism remains. A typical response by those unpersuaded that developmental science has powerful legal and policy relevance is to point out that many (perhaps

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1. The Supreme Court in a series of Eighth Amendment opinions has struck down harsh sentences for juvenile offenders. *See* Roper v. Simmons, 543 U.S. 551 (2005); Graham v. Florida, 560 U.S. 48 (2010); Miller v. Alabama 567 U.S. 460 (2012); Montgomery v. Louisiana, 136 S. Ct. 718 (2016).

2. *See generally* Elizabeth Scott et al., *Juvenile Sentencing Reform in a Constitutional Framework*, 88 TEMP. L. REV. 675 (2016).

most) adolescents do not engage in serious criminal activity; thus, normative biological and psychological factors associated with adolescence are unlikely to play the important role in juvenile offending that is posited by those supporting the reform trend.[3] Not surprisingly, these skeptics are inclined to discount the relevance of adolescent immaturity to justice policy.[4]

To be sure, not all adolescents commit crimes—and, certainly, very few commit serious offenses.[5] As the skeptics' challenge suggests, one oversimplifies the argument for developmentally-based justice policies if one takes it to mean that features associated with biological and psychological immaturity alone lead teenagers to engage in illegal conduct. The decision to offend, like much behavior in adolescence, is the product of dynamic interaction between the still-maturing individual and her social context. In this Article, we analyze this intricate relationship and clarify how social environment influences adolescent choices in ways that incline or deter involvement in crime and in other risky behavior.

The claim that social context influences teenage criminal behavior is familiar[6] and relatively uncontroversial. What has not received much attention is the relationship between biology (and psychology) and environment, and the mechanisms through which particular tendencies and traits associated with adolescent brain development interact with environmental influences to encourage antisocial or prosocial behavior. Brain development in adolescence is associated with reward-seeking behavior and limited future orientation.[7] It is also associated with increased sensitivity to external stimuli, and particularly with heightened susceptibility to peer influence, which in turn contributes to emotional

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3. GIDEON YAFFE, THE AGE OF CULPABILITY: CHILDREN AND THE NATURE OF CRIMINAL RESPONSIBILITY 18 (2018). *See also Graham*, 560 U.S. at 112 (Thomas, J., dissenting); *Miller*, 567 U.S. at 513 (Thomas, J., dissenting); *Roper*, 543 U.S. at 614 (Scalia, J., dissenting).

4. Critics, such as Justice Scalia, have noted that advocates view adolescents as mature for purposes of making abortion decisions. *See Roper*, 543 U.S. at 617 (Scalia, J., dissenting).

5. Howard N. Snyder & Melissa Sickmund. *Law Enforcement and Juvenile Crime, in* JUVENILE OFFENDERS AND VICTIMS: 2006 NATIONAL REPORT at 125 (2006).

6. *See Roper*, 545 U.S. at 569; *Graham*, 560 U.S. at 68 (recognizing the importance of peer influence on offending).

7. Adolescents tend to focus on short-term, and to discount long term, consequences of choices and behavior, particularly under conditions of emotional or social arousal. *See* discussion *infra* Part I.A.1._

arousal and impulsivity.[8] In short, social environment can play a powerful role in inclining teenagers toward risk-taking (and generally in shaping adolescent behavior); this is because, compared to adults, adolescents are particularly responsive to external stimuli (especially their peers), easily aroused emotionally, and less able to regulate strong emotions. Because they are easily aroused, adolescents are also more sensitive to threats than are adults.[9] These external influences can override the adolescent's still-developing ability to make reasoned decisions.

These tendencies associated with adolescent brain development can manifest in different teenagers in different ways; heightened tendencies toward risk-taking may impel antisocial acts in some teens, but more aggressive play on the athletic field in others.[10] Depending on the nature of the social environment, these biologically-driven inclinations can be activated "in the moment" to contribute to risky behavior, including fast driving, excessive drinking, unsafe sex, and criminal activity.[11] In this Article, we examine the interaction between developmental tendencies and contextual influences that promote or deter risk-taking and criminal involvement.

The endogenous factors that contribute to risky behavior are normative in adolescence. Although studies find substantial variations in individual propensities, adolescents, on average, exhibit these tendencies and engage in risk-taking to a greater extent than do adults. Indeed, the combination of reward-seeking, impulsivity, easily aroused emotions, and susceptibility to peer influence leads a large percentage of teens to occasionally behave in ways that could be the basis of criminal charges.[12] But, a teenager who lives in a high-crime neighborhood with many antisocial peers is more likely to get involved in criminal activity than one in a neighborhood with few such peers, even though the two may not differ in their propensities

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8. *See* discussion *infra* Part I.A.2 and Part I.A.3.

9. *See* Alexandra O. Cohen et al., *When is an Adolescent an Adult? Assessing Cognitive Control in Emotional and Nonemotional Contexts* 27 PSYCHOL. SCI. 549, 549-62 (2016).

10. *See* Laurence Steinberg, *The Influence of Neuroscience on U.S. Supreme Court Decisions Involving Adolescents' Criminal Culpability*, 14 NATURE REV. NEUROSCI. 513, 513-18 (2013).

11. *See* Leah H. Somerville, Rebecca M. Jones, & B.J. Casey. *A Time of Change: Behavioral and Neural Correlates of Adolescent Sensitivity to Appetitive and Aversive Environmental Cues*, 72 BRAIN COGN. 124, 124-133 (2010).

12. *See* Laurence Steinberg, *A Social Neuroscience Perspective on Adolescent Risk Taking*, 28 DEV. REV. 78, 78-106 (2008).

for risk-taking.[13] Developmental tendencies might lead the first youth to engage in criminal activity, something he would likely not consider on his own. For example, if his peers were into car racing, or if drugs were readily available and popular in the neighborhood, risk-taking behavior might take these forms. Alternatively, if he were a member of a close-knit and highly competitive basketball team, the interaction of peer influence and reward-seeking might lead to socially accepted risk-taking on the basketball court.

Scientific knowledge about the interaction between the developing adolescent and his or her social context is also important in designing correctional facilities and structuring programs for juveniles. For juveniles in the justice system, the correctional facility or program constitutes the social environment for development during the period of the sanction. Therefore, the correctional setting can have either a positive or negative impact on the young offender's future life. The adolescent brain is more malleable, or "plastic," than that of adults,[14] and because of increased plasticity, teenagers are particularly responsive to environmental stimuli, both positive and negative. During this formative developmental stage,[15] environmental influences can shape the trajectory of individuals' lives. Psychologists explain that healthy maturation during adolescence is an extended and interactive process between the individual and her social context, in which opportunities in the social environment facilitate or impede accomplishment of developmental tasks necessary to effective adult functioning.[16] A justice policy that aims to reduce recidivism and maximize the potential for juvenile offenders' transition to non-criminal adulthood recognizes the importance of social context by structuring programs and facilities to promote positive development during this formative stage.

Our inquiry into the dynamic interaction between brain development in adolescence and social context offers powerful support for policies that subject adolescent offenders to more lenient sanctions than adults receive

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13. *See* discussion *infra* Part II.

14. *See* LAURENCE STEINBERG, AGE OF OPPORTUNITY: LESSONS FROM THE NEW SCIENCE OF ADOLESCENCE at 18 (2014).

15. See discussion *infra* Part I.

16. Steinberg, *supra* note 14, at 11.

and that tailor dispositions to juveniles' developmental needs. Our examination confirms and illuminates the Supreme Court's conclusion that juveniles deserve less punishment than adult offenders because their offenses are driven by biological and psychological immaturity, and also because, as legal minors, juveniles cannot extricate themselves from social contexts (neighborhoods, schools and families) that contribute to involvement in crime.[17] Our interactive model also confirms that correctional facilities and programs are social settings that can support healthy development to adulthood in individual offenders, but can also affect young offenders' lives in harmful ways.[18] Thus our analysis provides a sound empirical and theoretical foundation for developmentally-based justice policies that have emerged over the past decade. Our analysis also informs a long-standing debate of whether an offender's deprived social environment mitigates criminal responsibility. Proponents argue that mitigation applies to defendants who have experienced severe deprivation on the ground that their impoverished environment undermined their ability to act as law abiding citizens.[19] This argument has been largely dismissed as undermining free will and as diluting responsibility for a broad range of offenders.[20] Our analysis narrows and sharpens the claim that social context is relevant to the punishment of juveniles on both retributivist and consequentialist grounds.

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17. Laurence Steinberg & Elizabeth S. Scott, *Less Guilty by Reason of Adolescence*, 58 AM. PSYCHOL. 1009 (2003); Elizabeth S. Scott & Laurence Steinberg, *Blaming Youth*, 81 TEXAS L. REV. 799 (2003). The Supreme Court adopted this position in its 8th Amendment opinions. *Roper*, 545 U.S. at 569; *Miller*, 567 U.S. at 471; *Montgomery*, 136 S. Ct. 718, at 733.

18. *See* discussion *infra* Part III.

19. *See* David Bazelon, *The Morality of the Criminal Law*, 49 S. CAL. L. REV. 385 (1976). Judge Bazelon first developed the argument in *United States v. Alexander*, 152 U.S. App. D.C. 371, 471 F.2d 923, 957-65 (1972). The argument was developed more fully by Richard Delgado, *Rotten Social Background: Should the Criminal Law Recognize a Defense of Severe Environmental Deprivation?*, 3 LAW & INEQ. J. 9 (1985). *See also* Richard Delgado, *The Wretched of the Earth*, 2 ALA. C.R. & C.L. L. REV. 1 (2011); Andrew Taslitz, *The Rule of Criminal Law: Why Courts and Legislatures Ignore Richard Delgado's Rotten Social Background Defense*, 2 ALA. CIV. RTS. & CIV. LIBERTIES. L. REV. 79 (2011); Michele Estrin Gilman, *The Poverty Defense*, 47 U. RICH. L. REV. 495, 501-02 (2013).

20. Stephen Morse has offered the most sophisticated rebuttal of deprivation as a defense. *See* Stephen J. Morse, *Deprivation and Desert*, *in* FROM SOCIAL JUSTICE TO CRIMINAL JUSTICE: POVERTY AND THE ADMINISTRATION OF THE CRIMINAL LAW, 114 (William Heffernan & John Kleinig, eds, 2000); Stephen J. Morse, *Severe Environmental Deprivation: A Tragedy, Not a Defense*, 2 ALA. C.R. & C.L. L. REV. 147 (2011). *See also* Sanford H. Kadish, *Excusing Crime*, 75 CAL. L. REV. 257, 284-85 (1987).

A brief roadmap of the Article may be helpful. In Part I, we review the research evidence describing biological and psychological features of adolescent brain development that are relevant to risk-taking and offending. This research offers powerful support for the legal judgment that juveniles' criminal choices often are influenced by factors associated with normative development. Part I concludes with a description of recent cross-cultural research indicating that these attributes inhere in adolescence as a developmental stage and are not solely the product of particular social contexts.[21]

Part II analyzes how the traits described in Part I can influence behavior in a variety of ways, depending on social context, resulting in neutral, anti-social, or prosocial outcomes. As we explain, environmental factors can minimize or intensify the extent to which emotional factors contribute to risk-taking behavior—and the kinds of risky behavior chosen. Most important is the influence of peer group (constituted of other reward-seeking and impulsive adolescents). Part II then focuses directly on criminal involvement; the interaction between social context and normative biological and psychological factors in the still-maturing individual can influence the teen's involvement in an antisocial peer group and in criminal activity. In most teens, this interaction abates as the adolescent matures, leading to desistence. Part II describes briefly a category of young offenders less likely than normative adolescents to desist from antisocial activity with maturity because their offending is driven by various dispositional and environmental factors—many of which predated adolescence—and not primarily by the interaction of developmental factors and social context.

Part III explores how the social environment created by correctional programs and facilities can impede or enhance healthy brain development, because the facilities and programs through which law responds to juvenile crime create the social context for the developing young offender. Evidence of brain malleability provides reinforces the conclusion that the correctional context can influence development in a positive or negative direction, while other research points to elements of that context that can facilitate healthy maturation.

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21. Laurence Steinberg et al., *Around the World, Adolescence is a Time of Heightened Sensation Seeking and Immature Self-Regulation,* 12532 DEV. SCI. 1, 1-13 (2017).

Part IV analyzes the implications for law and policy of the interactive model of juvenile offending. The analysis provides strong support for constitutional and legal trends that have emerged in the past decade based on the premise that juveniles are different from adult offenders and that the justice system should recognize these differences. Our analysis confirms conventional wisdom that immature brain development influences offending, but also explains how the teen's interaction with his or her social context plays an important role. We also clarify how correctional programs can facilitate or undermine healthy development in adolescence, and highlight the importance of social context as a key element in policies that aim to prevent crime and promote desistence in young offenders.

I. PSYCHOLOGICAL AND BIOLOGICAL IMMATURITY

In this Part, we describe the features of psychological and neurobiological development in adolescence that form the foundation of our interactional model of teenage risk-taking behavior. This growing body of developmental research provides powerful support for the constitutional principle that "children are different,"[22] and for the growing trend toward acknowledging these differences in the legal response to juvenile crime. The research also clarifies that the developmental tendencies that contribute to involvement in crime also incline adolescents toward risk-taking generally, and that offending is a part of a larger picture.

Adolescent risk-taking can be understood, in part, as arising from a "maturity gap" between cognitive and psychosocial development. It is well understood that emotional and social maturation lags behind intellectual development and that adolescents' capacity for self-regulation is immature. As compared to adults, adolescents are particularly inclined toward reward-seeking and are extremely sensitive to their social context and particularly to peers.[23] This combination of features contributes to emotional arousal,[24] and when teenagers are emotionally aroused, they

22. *See* Miller v Alabama, 567 U.S. 460, 480-81 (2012).
23. *See* Steinberg *supra* note 12.
24. *See* Sarah-Jane Blakemore & Kathryn L. Mills, *Is Adolescence a Sensitive Period for*

tend to make impulsive, short-sighted choices and engage in risky behaviors that they might understand are ill-advised when considered in a neutral setting. This Part describes a "dual systems" model of brain development offered by developmentalists to explain adolescents' tendency toward impulsive risky choices: While brain systems implicated in reward-seeking and sensitivity to peers develop early in adolescence around puberty, brain systems that govern self-regulation mature gradually through adolescence and into early adulthood.[25] Finally, this Part explains that these attributes and tendencies are endogenous to the developmental stage of adolescence and are found in teenagers across cultures.

A. Developmental Factors Contributing to Risk-Taking

This section describes three features of adolescence that likely contribute to adolescents' inclination to engage in risky behavior to a greater extent than adults. Both biological and behavioral research confirms that, as compared to adults, adolescents are more inclined toward reward-seeking, more sensitive to social context, and more impulsive in their choices, especially under conditions of emotional arousal. Each of these tendencies is linked to normative brain development.

1. Reward Seeking

Substantial research evidence supports the conclusion that adolescents are sensitive to rewards and inclined toward reward- or sensation-seeking to a greater extent than adults, and that they focus on rewards rather than risks in making choices. As discussed below, this inclination is normative in adolescence; indeed, increased sensation-seeking is adaptive developmentally as it encourages adolescents to explore their environment and develop a sense of identity and autonomy.[26] But, reward-seeking also interacts with teenagers' sensitivity to peers in ways that can contribute to

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Sociocultural Processing? 65 ANNUAL. REV. PSYCHOL. 187 (2014).

25. *See* discussion *infra* Part I.A.3.

26. *See* Eveline A. Crone & Ronald E. Dahl, *Understanding Adolescence as a Period of Social-Affective Engagement and Goal Flexibility*, 13 NATURE REV. NEUROSCI. 636, 636-50 (2012); Bruce J. Ellis et al., *The Evolutionary Basis of Adolescent Behavior: Implications for Science, Policy, and Practice*, 48 DEV. PSYCH. 598, 598-623 (2012).

harmful risk-taking.

During early adolescence, regions of the brain associated with "incentive processing," or the valuation and prediction of rewards, undergo substantial changes resulting in heightened reward sensitivity during this period.[27] Researchers have linked these changes to hormonal developments during puberty that increase the number of dopamine receptors in the brain that are implicated in approach behaviors and the experience of pleasure.[28] As a result, adolescents evince increased dopamine cell firing in response to rewarding stimuli,[29] which affects feedback learning, sensitivity to social evaluation and loss, and incentive-driven responses.[30]

Neurodevelopmental studies of risk behavior generally suggest that heightened risk-taking in adolescence is associated with greater activation of reward-sensitive brain regions among adolescents as compared to adults.[31] In brain imaging studies, when presented with images of rewarding stimuli, such as smiling faces, adolescents evince a stronger response in reward-processing regions than do children or adults. Moreover, the extent to which individuals show this sensitivity to reward is correlated positively with risk-taking.[32] This suggests that risk-taking is, to some extent, intrinsically rewarding to adolescents, or that adolescents are more sensitive to potential rewards associated with risks.

A large body of behavioral research confirms that adolescents are more sensitive to rewards and more inclined toward reward-seeking than are adults; these findings are consistent with the neurobiological evidence. In these studies, researchers typically measure reward-seeking using self-report scales that assess characteristics such as thrill- or novelty-seeking,

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27. *See* Jason Chein et al., *Peers Increase Adolescent Risk Taking by Enhancing Activity in the Brain's Reward Circuitry,* 14 DEV. SCI. F1, F2 (2011).

28. *See* Dustin Wahlstrom, Paul Collins, Tonya White, & Monica Luciana, *Developmental Changes in Dopamine Neurotransmission in Adolescence: Behavioral Implications and Issues in Assessment,* 72 BRAIN COGN. 146, 146-59 (2010).

29. *See* Aarthi Padmanabhan & Beatriz Luna, *Developmental Imaging Genetics: Linking Dopamine Function to Adolescent Behavior,* 89 BRAIN COGN. 27, 27-38 (2014).

30. *See* Wahlstrom et al., *supra* note 28.

31. *See* Adriana Galvan et al., *Risk-Taking and the Adolescent Brain: Who is at Risk?* 10 DEV. SCI. F8, F8-F14 (2007).

32. Dustin Albert & Lawrence Steinberg, *Judgment and Decision Making in Adolescence,* 21 J. RES. ADOLESC. 211, 217-218 (2011).

or behavioral tasks that assess responsiveness to rewarding stimuli (such as monetary rewards). For example, some studies use gambling tasks in which individuals must learn to discriminate between gambles that are likely to be rewarding (e.g., drawing cards from a deck that is likely to pay off) and those that are likely to be costly (e.g., drawing cards from decks that are likely to lead to losses).[33] Others have used "temporal discounting" tasks, in which players are asked to choose between smaller, immediate rewards (e.g., $200 today) versus larger, but delayed ones (e.g., $1,000 in six months).[34]

Both self-report[35] and behavioral[36] studies of reward-seeking indicate that this behavior peaks in mid-adolescence, and subsequently declines in adulthood. Cross-sectional studies of performance on gambling tasks demonstrate that mid- to late adolescents learn from rewards at a faster rate than do their younger peers or adults; these studies also demonstrate that the tendency to learn more quickly from rewarding experiences than from costly ones is substantially stronger among teens than among adults, who tend to learn from rewarding and costly experiences at similar rates.[37] Studies of temporal discounting have found that younger adolescents demonstrate a stronger preference for smaller, immediate rewards, whereas older adolescents and adults are willing to wait longer for larger ones.[38] Studies also show that younger adolescents characterize themselves in self-report surveys as being less future-oriented (i.e., regulating behavior in favor of long-term goals) and less inclined to consider the future consequences of their actions.[39] Thus, mid-adolescents (ages fifteen through seventeen) demonstrate a heightened sensitivity to rewards compared to younger or older individuals, and this sensitivity seems to

33. *See* Elizabeth Cauffman et al., *Age Differences in Affective Decision Making as Indexed by Performance on the Iowa Gambling Task,* 46 DEV. PSYCHOL. 193, 193-207 (2010).

34. *See* Laurence Steinberg et al., *Age Differences in Future Orientation and Delay Discounting,* 80 CHILD DEV. 28, 28-44 (2009).

35 *See* Anahi Collado, Julia W. Felton, Laura MacPherson, & C.W. Lejuez, *Longitudinal Trajectories of Sensation Seeking, Risk Taking Propensity, and Impulsivity Across Early to Middle Adolescence,* 39 ADDICT. BEHAVE. 1580, 1580-88 (2014).

36. *See* Dana G. Smith, Lin Xiao, & Antoine Bechara, *Decision Making in Children and Adolescents: Impaired Iowa Gambling Task Performance in Early Adolescence,* 48 DEV. PSYCHOL. 1180, 1180-87 (2012).

37. *See* Cauffman et al., *supra* note 33.

38. *See* Steinberg et al. *supra* note 34.

39. *See* Steinberg et al., *supra* note 34.

motivate decision-making that is oriented toward the present rather than the future, even if the future-oriented decision is superior.

2. Sensitivity to Social Environment.

Adolescence is a period of heightened sensitivity to the social environment and the individual's relationship to that context. Recent research indicates that a network of brain systems governing thinking about social relationships undergoes significant changes in adolescence in ways that increase individuals' concern about the opinion of other people, particularly peers.[40] These brain regions, sometimes collectively referred to as "the social brain," are more easily activated in adolescence than before or after, making teenagers especially attuned to both the positive and negative emotions of those around them.[41] During this developmental period, individuals are more sensitive to both praise and rejection than are either children or adults, making them potentially more susceptible to peer influence and responsive to threats.[42]

Recent evidence sheds light on the relationship between peer sensitivity and reward-seeking in adolescence, with important implications for adolescent risk-taking. Jason Chein and colleagues have examined the impact of the presence of peers on individuals' neural responses to a potential reward, comparing adolescents between ages fourteen to eighteen, with younger (nineteen to twenty-two) and older (twenty-four to twenty-nine) adults making decisions in a simulated driving task. The study found that observation by peers increased activation in reward-related brain regions in adolescents but not in the adults, and that activity in these regions predicted risk-taking (running a stoplight to complete the task faster) in the tasks.[43]

Much behavioral research confirms adolescents' sensitivity to peers, and finds a correlation between peer influence and risk-taking in

40. *See* Sarah-Jane Blakemore, *Development of the Social Brain in Adolescence,* 105 J. R. SOC. MED. 111, 111-16 (2012); Blakemore & Mills, *supra* note 24.

41. Blakemore & Mills, *supra* note 24.

42. *See* Amanda E. Guyer et al., *Probing the Neural Correlates of Anticipated Peer Evaluation in Adolescence*, 80 CHILD DEV. 1000, 1000-15 (2009); Michael Dreyfuss et al., *Teens Impulsively React Rather than Retreat from Threat*, 36 DEV. NEUROSCI. 220, 220-27 (2014).

43. *See* Chein et al., *supra* note 27, at 7. Risk taking involved running stoplights, risking a crash.

adolescence. Social scientists have studied age differences in responses to peer influence by presenting individuals with hypothetical dilemmas involving peer influence. Studies presenting participants with situations involving pressure to engage in antisocial conduct have found that peer influence increases between childhood and mid-adolescence and declines slowly during the late adolescent years.[44] Peer influence can operate directly when teenagers respond to peer pressure; however, desire for peer approval and fear of rejection also affect adolescents' choices more than those of adults.[45] The increased salience of peers likely makes their approval especially important in group situations. It is not surprising, perhaps, that juveniles are far more likely to offend in groups than are adults.[46]

It is well established that adolescents take more risks in the presence of peers than when they are alone or with an adult,[47] and that this "peer effect" is not found among adults.[48] The presence of peers also influences risk preference among adolescents, as adolescents (but not adults) are more likely to endorse the benefits of risky activities relative to costs in the presence of peers than when they are alone.[49] One study has found that the presence of peers increases risk-taking among adolescents even when they are given information about the probability of positive and negative outcomes.[50]

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44. This pattern has been long established. *See* Thomas J. Berndt, *Developmental Changes in conformity to Peers and Parents*, 15 DEV. PSYCHOL. 608, 608-616 (1979); Kathryn C. Monahan, Laurence Steinberg, & Elizabeth Cauffman, *Affiliation with Antisocial Peers, Susceptibility to Peer Influence, and Desistance from Antisocial Behavior During the Transition to Adulthood*, 45 DEV. PSYCHOL. 1520, 1520-30 (2009)

45. *See* Guyer et al., *supra* note 42, at 1001.

46. *See* Franklin E. Zimring & Hannah Laqueur, *Kids, Groups, and Crime: In Defense of Conventional Wisdom*, 52 J. RES. CRIME DELINQ. 403, 403-413 (2015).

47. *See* Margo Gardner & Laurence Steinberg, *Peer Influence on Risk-Taking, Risk Preference, and Risky Decision-Making in Adolescence and Adulthood: An Experimental Study*, 41 DEV. PSYCHOL. 625, 625-35 (2005); Karol Silva, Jason Chein, & Laurence Steinberg, *Adolescents in Peer Groups Make More Prudent Decisions When a Slightly Older Adult is Present*, 27 PSYCHOL. SCI. 322, 322-30 (2016).

48. *See* Dustin Albert, Jason Chein, & Laurence Steinberg, *Peer Influences on Adolescent Decision Making*, 22 CURR. DIR. PSYCHOL. SCI. 114, 114-120 (2013).

49. *See* Gardner & Steinberg, *supra* note 47.

50. *See* Ashley Smith, Jason Chein, & Laurence Steinberg, *Peers Increase Adolescent Risk Taking Even When the Probabilities of Negative Outcomes are Known*, 50 DEV. PSYCHOL. 1564, 1564-68 (2014).

3. Impulsivity and Cognitive Control

When adolescents are emotionally aroused by the anticipation of rewards in the presence of peers, they tend to make riskier choices that they are less able to control than are adults. As described in Section B below, deficits in self-control in adolescence are thought to derive from immaturity in the system of cognitive regulation, which is centered in the prefrontal cortex, and its connections to social and emotional brain regions. This system develops slowly during adolescence and is not fully mature until the early to mid-twenties. In adolescence, it can be overwhelmed by emotional and social responses, contributing to short-sighted choices.[51]

Studies measure self-regulation using both self-report scales that assess the tendency to act without thinking (e.g., "I act on the spur of the moment") and behavioral tasks that require individuals to resist making automatic, reactive responses to specific stimuli. Studies of self-reported impulse control find that this psychological trait improves into early adulthood.[52] Age patterns in studies involving behavioral tasks are more complex. On simple tasks requiring only that participants inhibit an automatic response, individuals demonstrate adult levels of self-regulation by mid-adolescence.[53] In contrast, mature performance is not observed until early adulthood when tasks involve distractions that cause attentional interference or require planning and complex reasoning.[54]

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51. *See* Bernd Figner, Rachael J. Mackinlay, Friedrich Wilkening, & Elke U. Weber, *Affective and Deliberative Processes in Risky Choice: Age Differences in Risk Taking in the Columbia Card Task*, 35 J. EXP. PSYCHOL. LEARN. MEM. COGN. 709, 709-30 (2009).

52. *See* Laurence Steinberg et al., *Age Differences in Sensation Seeking and Impulsivity as Indexed by Behavior and Self-Report: Evidence for a Dual Systems Model*, 44 DEV. PSYCHOL. 1764, 1764-78 (2008); Steinberg, *supra* note 11, at 4.

53. For example, on the Stroop task, participants are asked to quickly and accurately indicate the color in which a word is displayed while ignoring its semantic meaning. When a color word is displayed in an incongruent color (e.g., the word 'blue' displayed in green font), the participants must inhibit the automatic response to read the word and instead respond on the basis of the word's physical color. Studies using the traditional Stroop color-word task find no differences in cognitive control between mid-adolescents and adults. *See* Jessica R. Andrews-Hanna et al., *Cognitive Control in Adolescence: Neural Underpinnings and Relation to Self-Report Behaviors*, 6 PLOS ONE, e21598, 1-14 (2011).

54. *See* Monica Luciana et al., *The Development of Nonverbal Working Memory and Executive*

The most interesting recent research measuring impulse control has compared responses to behavioral tasks under neutral (non-emotional) and emotional conditions. These studies have found that adolescents perform poorly on self-control tasks under emotional conditions and that performance under both neutral and emotional conditions improves into adulthood.[55] A major study sponsored by the MacArthur Foundation Research Network on Law and Neuroscience (of which two of us were members) is illustrative. In this research, almost 150 adolescents, (between thirteen and seventeen), young adults (eighteen to twenty-one) and older adults (twenty-two to twenty-five) were asked to perform a standard task measuring self-control under neutral conditions and conditions involving positive and negative emotional arousal (anticipation of winning money versus hearing an aversive sound). Under conditions of positive arousal, adolescents' performance on the self-control task was substantially poorer than that of the two adult groups, while under conditions of negative arousal, both the adolescent and young adult group performed more poorly than the older adults. Moreover, under emotionally arousing conditions, young adults evinced decreased activation in cognitive control networks and increased activation in brain regions implicated in emotional processing; this combination is thought to have contributed to poorer performance on the self-control task.[56] Another recent study found that those adolescents whose self-control was disrupted during emotionally arousing tasks engaged in more risk-taking during driving simulation tasks than did same-aged individuals whose self-control was less disrupted.[57] Other studies have shown that social arousal, created by the presence of peers, activates reward regions in the adolescent brain,[58] which in turn is

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Control Processes in Adolescents, 76 CHILD DEV. 697, 697-712 (2005).

55. For example, studies using an emotional version of the Stroop, *see id.*, in which colors and color-words are replaced with emotional faces and phrases, report improvements in self-regulation into adulthood. Even under neutral conditions, adolescents perform more poorly than older adults. *See* Cohen, *supra* note 9, at 559.

56. *See* Alexandra O. Cohen et al., *The Impact of Emotional States on Cognitive Control Circuitry and Function* 28 J. COG. NEUROSCI. 446, 446-59 (2016).

57. *See* Morgan Botdorf et al., *Adolescent Risk-Taking is Predicted by Individual Differences in Cognitive Control Over Emotional, But Not Non-Emotional, Response Conflict*, 31 COGNITION & EMOTION 972, 972-79 (2017).

58. *See* Ashley Smith et al., *Age Differences in the Impact of Peers on Adolescents' and Adults' Neural Response to Reward*, 11 DEV. COG. NEUROSCI. 75, 75-82 (2015).

associated with riskier decision making.[59] The evidence that emotional contexts interfere with self-control in adolescence sheds light on teenagers' heightened tendency to engage in risk taking in emotionally and socially arousing contexts.[60]

Together with research demonstrating that adolescents tend to evince greater reward seeking and relatively less self-regulation compared to adults, studies also show that these psychological traits are linked with greater engagement in risk taking. For example, higher levels of reward seeking have been associated with self-reported substance use, delinquent acts, and risky driving, as well as risk taking on several laboratory measures of risk taking. Similarly, greater impulsivity has been associated with higher rates of self-reported substance use and delinquent activity, as well as with increased risk taking on behavioral risk taking tasks.[61]

B. Dual Systems Model of Risk Taking

Developmental scientists in recent years have offered "dual systems" or "maturational imbalance" models in seeking to explicate the relationship between emotional immaturity and risk-taking.[62] Brain maturation comprises several processes that vary in their developmental timetable across different brain regions: Dual systems models emphasize research showing that brain systems involved in reward seeking and those regulating self control follow different developmental trajectories.[63] This imbalance, it is believed, results in poor regulation of emotions and a tendency to focus on the immediate rewards of choices, while discounting

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59. *See* Chein et al., *supra* note 27, at 7.

60. *See* B.J. Casey, *Beyond Simple Models of Self-Control to Circuit-Based Accounts of Adolescent Behavior*, 66 ANN. REV. PSYCHOL. 295, 295-319 (2015); Ashley Smith, Jason Chein & Laurence Steinberg, *Impact of Socio-Emotional Context, Brain Development, and Pubertal Maturation on Adolescent Risk-Making*, 64 HORMONES & BEHAV. 323, 323-32 (2013).

61. *See* Natasha Duell, Grace Icenogle & Laurence Steinberg, *Adolescent Decision Making and Risk Taking*, CHILD PSYCHOLOGY: A HANDBOOK OF CONTEMPORARY ISSUES 263, 263-284 (L. Balter & C.S. Tamis-LeMonda eds., 3d ed. 2016).

62. *See* Smith et al., *supra* note 58; *and* Chein, *supra* note 27.

63. *See* B.J. Casey, *Beyond Simple Models of Self-Control to Circuit-Based Accounts of Adolescent Behavior*, 66 ANN. REV. PSYCHOL. 295, 298–300 (2015); Elizabeth P. Shulman et al., *The Dual Systems Model: Review, Reappraisal, and Reaffirmation*, 17 DEV. COG. NEUROSCI 103, 103-05 (2016).

long-term costs; this combination increases inclinations to engage in risky behavior, including offending.[64]

Neurodevelopmental research indicates that the development of subcortical brain regions implicated in socioemotional processing is more or less completed by adolescence. As explained above, these developments stimulate reward-seeking and increase sensitivity to peers, beginning with the onset of puberty and diminishing as individuals mature into young adulthood, such that these responses are particularly powerful during adolescence. Unlike the subcortical regions, the prefrontal cortex and other brain regions involved in impulse control and emotional regulation develop slowly through adolescence and are not mature until early adulthood.[65] The prefrontal cortex plays a key role in advanced cognitive abilities, including planning ahead, comparing risk and reward, and self-regulation. Immaturity in the prefrontal cortex is thought to make adolescents more susceptible than are mature adults to impetuous decision-making and more vulnerable to the effects of emotional and social arousal on cognitive functioning.[66]

Maturation of the prefrontal cortex involves multiple processes that are ongoing during adolescence but completed at different ages.[67] For example, synaptic pruning, which increases the efficiency of information processing, is largely complete by mid-adolescence; thus, basic cognitive capacities of reasoning and understanding are adult-like by about age fifteen and improve little in later years. In contrast, connectivity between prefrontal regions and the regions that process rewards and respond to emotional and social stimuli are not fully established until individuals are in their mid-twenties.[68] These connections are critically important to emotional regulation and impulse control. The prefrontal regions are

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64. *See* Steinberg, *supra* note 12; Shulman et al., *supra* note 63, at 103-17.

65. B.J. Casey, Sarah Getz & Adriana Galvan, *The Adolescent Brain*, 28 DEV. REV. 62, 62-77 (2008); Linda Patia Spear, *Adolescent Neurodevelopment*, 52 J. ADOLESCENT HEALTH S7, S7-S13 (2013).

66. Laurence Steinberg, *Should the Science of Adolescent Brain Development Inform Public Policy?*, 64 AM. PSYCHOL. 739, 739-50 (2009); *see* Elizabeth S. Scott, Richard J. Bonnie & Laurence Steinberg, *Young Adulthood as a Transitional Legal Category*, 85 FORDHAM L. REV. 641, 641-666 (2016).

67. *See* Cohen, *supra* note 9, at 2.

68. *See* Casey, *supra* note 60; Nico U. F. Dosenbach et al., *Prediction of Individual Brain Maturity using fMRI*, 329 SCI. 1358, 1358-1361 (2010); Bonnie et al., *supra* note 66.

implicated in feedback evaluation, integrating experiential information to guide future behavior, and controlling emotional impulses in favor of long-term goals.[69] The lack of functional connectivity leaves adolescents more prone than adults to making emotion-based decisions with inadequate cognitive oversight, suggesting why aspects of social and emotional functioning are slower to mature than basic cognitive functioning. Adolescents' deficient capacity to regulate behavior in the face of highly arousing stimuli may lead to suboptimal decision-making in contexts requiring the coordination of emotion and thinking. In sum, brain systems that govern "cold cognition" (thinking under neutral conditions) reach adult levels of maturity long before those that govern "hot cognition" (thinking under conditions of social and emotional arousal).[70]

C. Cross-cultural Research on Brain Development

For the most part, the developmental brain research that has informed our understanding of various aspects of the dual systems model has been conducted in the United States and a few Western European countries (most notably, the Netherlands).[71] Because expectations and norms for adolescent behavior vary considerably around the world, it is important to ask whether the account of the sensation-seeking, impulsive teenager that emerges from these studies accurately represents young people in other cultural and economic contexts. Adolescence in America and much of Western Europe is a time during which a certain degree of recklessness, especially in its socially acceptable forms, is tolerated—and perhaps even encouraged. Does this characterization of adolescents apply to young people growing up in less individualistic (and perhaps less permissive) cultural contexts?

A recent extensive study of more than 5,000 people between the ages of ten and thirty from eleven different countries suggests that it does.

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69. *See* Antoine Bechara, *Decision Making, Impulse Control and Loss of Willpower to Resist Drugs: A Neurocognitive Perspective*, 8 NAT'L NEUROSCI. 1458, 1458-63 (2005).

70. *See* Figner et al. *supra* note 51.

71. This includes research on heightened reward sensitivity during adolescence, protracted maturation of cognitive control through adolescence and into young adulthood, and the resulting propensity of adolescents, relative to children or adults, to engage in risk taking. *See* Shulman et al., *supra* note 63, at 4.

Laurence Steinberg and colleagues used identical test batteries to measure likely contributors to adolescent risk-taking in a diverse sample of countries (China, Colombia, Cyprus, India, Italy, Jordan, Kenya, the Philippines, Sweden, Thailand, and the United States) to determine whether the trajectories of sensation-seeking, self-control, and risk-taking are similar in these varied cultural contexts. Importantly, some of these countries are relatively more tolerant of adolescent recklessness (e.g., Sweden, and the United States), whereas, in others, young people are expected to demonstrate strong self-control (e.g., China and Jordan). Although there were differences among countries in patterns of psychological functioning, there were important and striking similarities.

Three such similarities are especially relevant to the present discussion: First, age trajectories of sensation-seeking and self-control that have been described in studies of American youth were observed internationally.[72] Scores on a composite measure of sensation-seeking (combining both self-reports and behavioral indicators) followed an inverted U-shaped pattern, increasing between preadolescence and late adolescence, peaking during the late teen years, and declining thereafter. On average, the peak was observed at a slightly older age (nineteen years) than had been reported in previous studies of American youth. Perhaps this is due to a somewhat later onset of puberty, which has been shown to contribute to the increase in reward sensitivity in adolescence,[73] in less developed nations than in developed ones; this would shift the average peak in sensation seeking to an older age when the sample is aggregated. In contrast, self-control matured gradually between pre-adolescence and the mid-twenties, at which point it plateaued in some countries (e.g., China, Italy) but continued to mature further in others (e.g., Colombia, Cyprus). Generally speaking, the prolonged maturation of self-control into the late-twenties was more likely to be seen in countries in which the increase during adolescence was less dramatic.[74] Taken together, these results suggest that the characterization of the late teen years as a time during which reward-seeking is heightened and self-regulation is still maturing applies cross-

72. *See id.*

73. *See* Grace Icenogle et al., *Puberty Predicts Approach But Not Avoidance on the Iowa Gambling Task in a Multinational Sample*, 88 CHILD DEV. 1598, 1598-1614 (2017).

74. *Id.*

culturally.

Second, the researchers found in other countries the inverted-U shaped trajectory of risk-taking that has been observed in the United States, with risky behavior more common during adolescence than before or after.[75] This set of analyses distinguished between real-world risk taking, measured through self-reports of involvement in activities such as drinking, riding with an intoxicated driver, vandalism, and fighting, and risk taking propensity, assessed with experimental tasks such as a the video driving game described earlier. The authors hypothesized that age patterns in real-world risk taking would be more culturally variable than age patterns in risk taking propensity, since the former is both a function of developmental immaturity and contextual opportunity, whereas the latter is not influenced by contextual conditions (i.e., the test setting was identical across the various countries). This hypothesis was confirmed: Countries were significantly more similar with respect to trajectories of risk taking propensity than with respect to real world risk-taking. Further, as expected, risk-taking propensity peaked earlier than did real-world risk taking, suggesting that the manifestation of adolescents' inherent inclination to engage in risky behavior is delayed by the real world context in which development occurs. Finally, the peak age for antisocial risk-taking was earlier (around age nineteen, similar to that reported in studies of the "age-crime curve") than that for health risk-taking (which peaked in the mid-twenties), presumably because the latter can be delayed by societally imposed constraints that are age-related (for example, age restrictions on purchasing alcohol).[76] This study is especially relevant to our interest in this essay, because it shows how the maturationally-driven tendencies inherent in adolescence can be tempered by social context.

Third, the researchers observed in the international sample the "maturity gap" found in American studies (described above),[77] in which cognitive abilities such as working memory reach adult levels of maturity well before the psychosocial capacities thought to contribute to reckless

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75. *See* Natasha Duell et al., *Age Patterns in Risk Taking Across the World,* 47 J. YOUTH ADOL. 1052 (2017).

76. *Id.*

77. *See* Laurence Steinberg et al., Elizabeth Cauffman, Jennifer Woolard, Sandra Graham, & Marie Banich, *Are Adolescents Less Mature than Adults? Minors' Access to Abortion, the Juvenile Death Penalty, and the Alleged APA "Flip-Flop"*, 64 AM. PSYCHOL. 583, 583-594 (2009).

behavior in adolescence.[78] Age patterns in cognitive abilities were far more similar internationally than patterns in psychosocial capacities; this likely is due to relatively greater cultural variability in expectations for psychosocial maturity than for intellectual competence. Most importantly, whereas the main period for maturation of cognitive competence was during early adolescence (tending to plateau around age sixteen), in virtually all of the countries studied considerable psychosocial maturation took place during the late teens and early twenties.[79]

This Part has explained that psychosocial factors associated with adolescent brain development contribute to a tendency toward risk-taking that declines as individuals mature. These tendencies are normative in adolescence and found across cultures. In the next Part, we turn to the questions of how these inclinations interact with social context and why teenagers vary substantially in the extent and form of risk-taking.

II. SOCIAL ENVIRONMENT AND RISKY BEHAVIOR IN ADOLESCENCE

Risk-taking in adolescence is driven by developmental factors, but as this Part explains, the individual adolescent's social context plays a critical role in triggering risky behavior; it also influences the forms of risk-taking in which the teenager engages. As the description of behavioral and biological research in Part I explained, endogenous developmental traits and tendencies associated with adolescence contribute to a heightened sensitivity to the social environment and an inclination to respond intensely to exciting and threatening stimuli in that environment. These stimuli contribute to emotional arousal, which, in the face of immature self-regulatory competence, can overwhelm the adolescent's cognitive capacity for rational choice, contributing to reckless behavior. This dynamic interaction is especially likely to be triggered in the presence or with the encouragement of peers, since adolescents are particularly oriented toward peers and susceptible to peer influence.[80] Peers play an

78. *See* Grace Icenogle, et al., *Adolescents' Cognitive Capacity Reaches Adult Levels Prior to Their Psychosocial Maturity: Evidence for a "Maturity Gap" in a Multinational Sample.* LAW HUM. BEHAV. (under review).

79. *Id.*

80. *See* discussion *infra* Part II.B.

important role in determining the extent and form of the individual adolescent's risk. Thus, an important contextual variable contributing to whether an adolescent becomes involved in criminal behavior is the degree to which his or her peer group is antisocial.[81] This Part explores how developmental changes in emotional arousability and self-regulation interact with the adolescent's social context to shape peer affiliations in ways that can lead to involvement in risky activities. Finally, this Part suggests why and how these tendencies dissipate and risk-taking declines with maturation.

A. Decision-making in a Neutral Context

As the discussion in Part I confirms, by mid-adolescence, individuals have the cognitive capacity to make rational decisions that is similar to that of adults. A teenager can understand and process information, engage in hypothetical thinking to compare alternative options and make reasoned decisions.[82] In short, when not subject to exogenous influences that undermine rationality, the normative adolescent usually is a competent decision-maker. This has been confirmed, for example, in studies of competence to stand trial, which does not improve after age fifteen.[83]

Much research supports the conclusion that adolescent decision-making is comparable to adults under neutral conditions but deteriorates when disrupted by external stimuli that contribute to emotional arousal. Early studies finding that adolescents were adult-like in their decision-making were conducted in laboratory settings under conditions in which the undistracted teenage subjects had time to respond to vignettes without stress.[84] Two important bodies of research focused on comprehension of

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81. Gary Sweeten, Alex Piquero, & Laurence Steinberg, *Age and the Explanation of Crime, Revisited*, 42 J. YOUTH & ADOLESCENCE 921 (2013).

82. *See* discussion *supra* Part I.B.

83. Thomas Grisso et al., *Juveniles' Competence to Stand Trial: A Comparison of Adolescents' and Adults' Capacities as Trial Defendants*, 27 L. & HUM. BEHAV. 333 (finding that 16 and 17 year old subjects performed as well as adults).

84. *See* Lois A. Weithorn & Susan B. Campbell, *The Competency of Children and Adolescents to Make Informed Treatment Decisions*, 53 CHILD DEV. 1589 (14 year olds competent to make medical decisions in laboratory setting); *see also* Bruce Ambuel & Julian Rappaport, *Developmental Trends in Adolescents' Psychological and Legal Competence to Consent to Abortion*, 16 L. & HUM. BEHAV. 129 (1992) (study of abortion decisionmaking with similar findings).

Miranda rights and ability to give informed consent to medical treatment. These studies found that that by mid –adolescence, teenagers performed similarly to adults.[85]

More recent research has sought to compare the impact on adolescent decision-making of neutral settings and settings in which subjects are exposed to external stimuli associated with emotional arousal. To test decision-making under states of emotional arousal, researchers have designed laboratory tasks with reward components (e.g., presenting images of happy faces or offering a monetary reward) and threat components (e.g., exposing participants to the possibility of hearing an aversive noise). Findings from these studies suggest that adolescents act more impulsively in the presence of both rewarding and threatening stimuli than under more neutral conditions.[86] Impulsive decision-making in the presence of an emotional stimulus has been associated with decreased activity in brain regions implicated in behavioral control and increased activity in brain regions involved in emotional processing.[87] Research evidence also suggests that, compared to adults, adolescents take more risks in the presence of rewarding stimuli.[88] In contrast, adolescents show comparably better impulse control and engage in less risky decision-making in neutral contexts (e.g., in the absence of a reward or peers).[89] Thus, research examining the impact of emotional stimuli on adolescent decision-making generally indicates that teenagers demonstrate a neural sensitivity to both rewards and threats that undermines impulse control and increases risky decision-making.

The interaction of social context with the decision-making competence of older adolescents is important in some legal settings. For example, a mature minor is likely competent to make a medical decision, which typically is made in a relatively neutral context. The adolescent is not likely to be subject to external conditions that contribute to emotional arousal or impulsive decision-making. Peers are seldom present and the inclination toward sensation-seeking is unlikely to be stimulated by the

85. *See* Duell et al., *supra* note 75.

86. *See* Cohen et al., *supra* note 9; *see also* B.J. Casey et al., *Braking and Accelerating of the Adolescent Brain*, 21 J. RES. ON ADOLESCENCE 21 (2011).

87. *Id.*

88. *See* Casey *supra* note 60; Figner et al., *supra* note 51.

89. *Id.*

anticipated short-term rewards of treatment, which are likely to be gradual.[90] Given these conditions, it is not surprising perhaps that mature minors are authorized to consent to some medical treatments without involving their parents, because they are presumed competent to do so.[91] In contrast, although laboratory studies have found that most older youths comprehend the meaning of *Miranda* rights,[92] there is good reason to question whether a juvenile in the real-world setting of an interrogation room is likely to make a competent decision about waiving or asserting these rights. Police tactics that combine implicit threats of punishment unless the juvenile agrees to waiver and promises of rewards (such as permission to end the interrogation) compound the stress of an interrogation for adolescents. Substantial evidence indicates that juveniles waive their *Miranda* rights at a much higher rate than do adults, and confess falsely at a higher rate.[93] It seems likely that the competence that teenagers show in the research setting is compromised by emotional factors in this social context, justifying special scrutiny of juveniles' waivers and confessions.[94]

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90. Steinberg et al., supra note 12. Cosmetic treatment is excluded under the mature minor rule, in part because health benefits are minimal. RESTATEMENT OF THE LAW, CHILDREN AND THE LAW (COUNCIL DRAFT 2) §19.01, Medical Decisions by Mature Minors (2017). Adolescents might also be more inclined to make impulsive decisions to obtain cosmetic treatment, focusing on immediate rewards. *Id.*

91. *See, e.g.,* Cardwell v. Bechtol, 724 S.W.2d 739, 748 (Tenn. 1987) (adopting the mature minor doctrine, factoring in "age, ability, experience, education, training, and degree of maturity or judgment obtained by the minor, as well as upon the conduct and demeanor of the minor at the time of the incident involved . . . , totality of the circumstances, the nature of the treatment and its risks or probable consequences, and the minor's ability to appreciate the risks and consequences."). Mature minors are authorized to make abortion decisions without involving their parents. *See generally* Bellotti v. Baird, 443 U.S. 622 (1979). Although this decision may be associated with more stress than other medical decisions, the adolescent has the opportunity to deliberate, distinguishing it from "in-the-moment" choices associated with risk-taking.

92. *See* Thomas Grisso, *Juveniles' Capacities to Waive Miranda Rights: An Empirical Analysis*, 68 CAL. L. REV. 1134, 1143 (1980) (finding deficiencies in fourteen and fifteen year olds, but not older youths).

93. Saul M. Kassin, *The Psychology of Confessions*, 4 ANN. REV. L. & SOC. SCI. 193 (2008).

94. RESTATEMENT, CHILDREN AND THE LAW (COUNCIL DRAFT), Rights of a Juvenile in Custody §14.21 (2016) (describing cases finding that juveniles are particularly vulnerable to coercion and that special scrutiny of waivers is required). Another important dimension of decision-making is background knowledge. Adults often rely on intuitive, non-deliberative decision-making, but they are more likely to make a less risky choice because they have knowledge and experience to lead them to that choice. Adolescents may lack this useful background. In the case of waiving their *Miranda* rights, not only do they have to make a choice on-the-spot in a stressful situation, but many youths also have

A final example provides a transition to our discussion of adolescent risk taking in the next section. In laboratory studies, adolescents are capable of perceiving the risks associated with different behaviors as well as adults, and they are no worse than adults at estimating their vulnerability to risk.[95] In fact, some studies suggest that adolescents overestimate the risks associated with various behaviors, including getting sick from alcohol or contracting a sexually transmitted infection.[96] But, in the presence of peers and free of adult supervision, teenagers' cognitive awareness of risk may do little to deter participation in dangerous, but exciting, activities such as drinking, drug use, fast driving and criminal offending. The confluence of exogenous influences and the adolescent's inclination toward reward-seeking can lead to reckless choices driven by emotional arousal. Through similar mechanisms, the perception of threat in the social context can lead to emotional arousal, undermining rationality and contributing to impulsive decisions.[97]

B. Risk-taking in Adolescence: The Risk-Inclined Individual in Risky Social Context

As the preceding section suggests, in a neutral setting, a normative adolescent is a competent decision-maker who perceives the risks of

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limited or no knowledge of the implications of their choice. *See generally* Bonnie L. Halpern-Felsher et al., *The Role of Behavioral Experience in Judging Risks*, 20 HEALTH PSYCHOL. 120 (2001); Elizabeth P. Shulman & Elizabeth Cauffman, *Deciding in the Dark: Age Differences in Intuitive Risk Judgment*, 50 DEV. PSYCHOL. 167 (2014).

95. Valerie F. Reyna & Frank Farley, *Risk and Rationality in Adolescent Decision Making: Implications for Theory, Practice, and Public Policy*, 7 PSYCHOL. SCI. IN THE PUB. INT. 1 (2006).

96. *See, e.g.*, Susan G. Millstein & Bonnie L. Halpern-Felsher, *Judgments about Risk and Perceived Invulnerability in Adolescents and Young Adults*, 12 J. RES. ON ADOLESCENCE 399 (2002). In one study exploring age differences in risk perception, individuals between the ages of 11 and 24 were asked to evaluate the riskiness, dangerousness, potential harmfulness, and relative costs of each of a series of risky activities such as riding in a car with a drunk driver, having unprotected sex, or shoplifting. Young adolescents ages 11-13 years were more likely than any other age group to rate these activities as risky, scary, dangerous, and more harmful than beneficial. After age 13, there were no age differences in risk perception; adolescents' risk perceptions were no different than those of younger teens. Elizabeth Cauffman et al., *Age Differences in Psychosocial Capacities Underlying Competence to Stand Trial*, 27 L. HUM. BEHAV. 333 (2003).

97. Cohen et al, *supra* note 9; Erika E. Forbes et al., *Neural Systems of Threat Processing in Adolescents: Role of Pubertal Maturation and Relation to Measures of Negative Affect*, 36 DEV. NEUROPSYCHOLOGY 429-52 (2011); *see also* Kassin, *supra* note 93.

dangerous choices as accurately as adults. In this section, we explore why many adolescents (and young adults) engage in risk-taking behavior at higher rates than older adults. We posit that much risk-taking behavior is a product of an adolescent inclined toward exciting or rewarding experiences (the normative adolescent), whose social context presents opportunities facilitating the pursuit of those experiences. "Opportunity" has two components: First, the risky activity must be accessible in the teenager's social context; and second, the adolescent associates with willing peers who encourage participation.[98]

1. Parental Influence and Accessibility of Risky Activity.

Adolescents are free to engage in risky behavior to a greater extent than younger children in part because they are subject to less supervision by parents and other adult authority figures. Developmentally appropriate separation from parents and increased freedom to associate with peers without supervision is a part of normal maturation and healthy development, processes through which teenagers learn to make their own decisions without external control.[99] However, less monitoring by parents, who (presumably) possess mature impulse control and an interest in promoting their children's welfare, leaves teenagers with less protection against developmentally normative impulsive choices and behavior.

Some parents, of course, exercise more supervision over their teenage children than others. The role that parents assume during this developmental stage can affect whether adolescents are allowed to pursue risky activities without constraint or are subject to appropriate discipline (which, to some extent, can limit opportunities for risk-taking).[100] The challenge for parents is to find the right balance between rigid restriction of their children's freedom and lax disengagement. Developmentalists explain that authoritative parenting is critically important to healthy development in adolescence.[101] Authoritative parenting involves active

98. Adolescents sometimes engage in risky activities without peers of course, as we discuss below; frequently they may anticipate peer approval.

99. LAURENCE STEINBERG, AGE OF OPPORTUNITY 44 (2014); *see also* Ellis et al., *supra* note 26.

100. Ralph J. DiClemente et al., *Parental Monitoring: Association with Adolescents' Risk Behaviors*, 107 PEDIATRICS 1363 (2001).

101. *See, e.g.*,ROBERT E. LARZELERE ET AL., AUTHORITATIVE PARENTING: SYNTHESIZING

engagement with the teenager's life but not excessive monitoring, which can either generate intense opposition or inhibit development of the individual's ability to make autonomous choices and live independently. The upshot is that even the best parenting will not prevent adolescent risk-taking. Optimally, parents (and other adults in authority) will present adolescents with opportunities to take developmentally appropriate risks, such as playing on a sports team, and seek to minimize opportunities for engaging in risks that compromise adolescents' health and well-being.

The freedom that adolescents need to separate from parents and learn to be independent, combined with the normative traits and tendencies of this developmental stage, increases teenagers' vulnerability to involvement in risky activities. The extent to which teenagers engage in risk-taking, and the form of that risk-taking, depends on opportunities presented in the adolescent's social context. For example, the leading cause of death for adolescents and young adults is motor vehicle crashes.[102] Alcohol use plays a part in this statistic (see below), but car racing (or just driving fast) is an exciting activity for young males, and one that reward-seeking teenagers are likely to pursue, given the opportunity. But, most teens will only engage in this activity when they are licensed to operate a vehicle by the state. Thus, while a fourteen-year-old has reward-seeking inclinations that are similar to those of an older teen, he will seldom engage in reckless driving.[103] Similarly, most New York City teenagers simply do not have the opportunity to engage in this form of risk-taking.[104]

The same analysis applies to other forms of risk-taking, such as alcohol and drug use. Although under-age drinking is common, acquiring alcohol becomes easier as individuals approach the legal minimum drinking age. College students and other young adults engage in underage drinking at far higher rates than do high school students.[105] Indeed, one rationale for

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NURTURANCE AND DISCIPLINE FOR OPTIMAL CHILD DEVELOPMENT (2013).

102. Laura Kann et al., *Youth Risk Behavior Surveillance – United States, 2015*, 54 SURVEILLANCE SUMMARIES 1 (2016).

103. Of course the younger unlicensed teen may be a passenger in a vehicle driven by an older teen.

104. Also cultural influences may be important. As noted earlier, a recent study of cross-cultural differences in adolescent risk taking found greater variability in real-world risk taking than in laboratory based measures of risk-taking propensity. Duell et al., *supra* note 75.

105. National Research Council, Committee on Juv. Justice Reform, Reforming Juvenile Justice:

setting the minimum age for purchasing alcohol at twenty-one was to reduce illegal drinking among *high school* students.[106] Lawmakers thought that lives would be saved by creating a substantial gap between the age at which individuals have ready access to alcohol and the minimum driving age. But, because alcohol is legal for adults (who are presumed less inclined toward risk-taking), it is readily available in every community, and, not surprisingly, a relatively high percentage of adolescents experiment with drinking. Perhaps unsurprisingly, given the relatively lower driving age in the United States than in most of the developed world, automobile fatalities among adolescents are higher here than abroad.[107]

Illegal drug use is another risky activity that might well appeal to many normative adolescents—reward-seeking individuals with immature impulse control who are inclined to focus on short-term benefits and discount long-term costs. In contrast to alcohol, drugs generally cannot be acquired legally, and both use and sale can result in criminal penalties. Thus, access and opportunities to engage in this risky activity are more limited and drug use among adolescents is less prevalent than alcohol use. Again, the teenager's social context plays a role in the form of risk-taking teenagers choose.

Teenagers' inclination to engage in unsafe sex provides a somewhat different variation on the theme, but also demonstrates how social context can increase or decrease the inclination to engage in risky activities. If teenagers are encouraged to use contraceptives and condoms, and such protection is readily available, the incidence of unsafe sex and pregnancy will be lower than if protection is difficult to obtain.[108] The immediate decision to have sex is likely to be driven by the reward-seeking, impulsive inclinations of adolescents, who may fail to consider the potential serious long term consequences. But if the adolescent can easily acquire contraceptives, the decision to have safe sex can be made in a more neutral setting in which the adolescent can rationally consider the

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A Developmental Approach (2013).

106. FRANKLIN E. ZIMRING, THE CHANGING LEGAL WORLD OF ADOLESCENCE **3-6** (2013).

107. Organization for Economic Co-operation and Development (OECD) & International Traffic Safety Data and Analysis Group, *Road Safety Annual Report 2013* (2013).

108. Douglas B. Kirby, *The Impact of Abstinence and Comprehensive Sex and STD/HIV Education Programs on Adolescent Sexual Behavior*, 5 SEXUALITY RES. & SOC. POL'Y 18 (2008).

benefit of avoiding pregnancy and disease.[109]

Adolescent involvement in criminal activity receives more attention from policymakers than any other form of teenage risk-taking. We postpone a comprehensive analysis of this issue until we have explored the role of peer influence, the primary dimension of social context influencing teenage criminal choices. But as our analysis in this section suggests, many other variables in the adolescents' social context can increase or decrease the likelihood that teenage risk-taking involves criminal activity, and, if so, the form of criminal activity. We have discussed the role of parents and the availability (or not) of activities that might tempt the reward-seeking teenager. But social context also includes the neighborhood, school, and community, each of which can either constrain or encourage the adolescent's inclination to get involved in risky, antisocial activities. The school, for example, may be a well-managed facility in which discipline is maintained and students, supervised by authoritative adults, engage in positive learning experiences and extra-curricular activities. Alternatively, the school can be a chaotic setting in which teachers and administrators have little control over students, and those students who are so inclined are free to pursue antisocial activities. In either case, social context plays a key role in deterring or facilitating antisocial activities.

2. Peer Influence and Risky Activity

Peers constitute the environmental stimuli that most powerfully influence adolescents' involvement in risky activities. As Part I showed, adolescents are susceptible to peer influence to a greater extent than either younger children or adults, and they also seek peer approval, which may involve initiating activities that peers will find exciting or pleasurable. In addition, recent research has shown that the mere presence of peers

109. Experts attribute a decline in teenage pregnancy rates recently to policies designed to facilitate contraceptive use by authorizing minors' independent access to contraceptives in convenient locations. Some evidence suggests that declines in teen pregnancy are linked to the increased use of long-acting reversible contraceptives that mitigate the effects of adolescent impulsivity. *See, e.g.*, Justin T. Diedrich et al., *Long-Acting Reversible Contraception in Adolescents: A Systematic Review and Meta-Analysis*, 216 AM. J. OBSTETRICS & GYNECOLOGY 364.e1 (2017), http://www.ajog.org/article/S0002-9378(16)46213-7/fulltext.

activates the brain's reward circuitry to a much greater extent among adolescents than adults, and that this heightened activation is linked to increased risk-taking.[110] Thus, peers play a major role in creating opportunities for risk-taking and in influencing whether an adolescent pursues particular opportunities otherwise available in the social environment.

The adolescent propensity for risk-taking is normative, but its form and extent are often driven by peers. Indeed, despite the hard-wired developmental traits that facilitate engagement in risky behavior, *solitary* risk-taking is less common among adolescents than among adults.[111] In real world settings, adolescents and young adults typically drink alcohol, use drugs, exceed the speed limit, and (particularly) commit crimes in the presence of, or in complicity with, peers to a greater extent than older adults.[112] Moreover, peers can influence teens in both pro-social and anti-social directions.[113] Pro-social peers can reinforce the goals of getting good grades and excelling in socially useful activities.[114] Indeed, research demonstrates that peers can have direct positive impact on adolescent risk behavior. For example, one laboratory-based study using a driving simulation game found that adolescents ages sixteen to seventeen demonstrated safer driving while in the presence of a cautious (rather than risky) peer, regardless of individual differences in susceptibility to peer pressure.[115] However, peers who encourage, facilitate, or support

110. Chein et al., *supra* note 27. As described in Part I, an adolescent in a laboratory setting, who is merely told that he or she is being observed by peers, experiences heightened activation in brain regions associated with reward processing and tends to take greater risks in completing assigned tasks than one who believes that he or she is alone.

111. Zimring & Laqueur, *supra* note 46.

112. Dustin Albert & Laurence Steinberg, *Peer Influences on Adolescent Risk Behavior*, *in* INHIBITORY CONTROL AND DRUG ABUSE PREVENTION: FROM RESEARCH TO TRANSLATION 211 (Michael T. Bardo et al. eds., 2011).

113. B. Bradford Brown et al., *A Comprehensive Conceptualization of the Peer Influence Process in Adolescence*, *in* UNDERSTANDING PEER INFLUENCE IN CHILDREN AND ADOLESCENTS 17 (Mitchell J. Prinstein & Kenneth A. Dodge eds., 2008); Sophia Choukas-Bradley et al., *Peer Influence, Peer Status, and Prosocial Behavior: An Experimental Investigation of Peer Socialization of Adolescents' Intentions to Volunteer*, 44 J. YOUTH & ADOLESCENCE 2197 (2015).

114. For example, members of a high school sports team can support each other in channeling their reward-seeking impulses in a direction that is less harmful than drinking or car racing.

115. *See* Christopher N. Cascio et al., *Buffering Social Influence: Neural Correlates of Response Inhibition Predict Driving Safety in the Presence of a Peer*, 27 J. COGNITIVE NEUROSCIENCE 83 (2015).

involvement in risky activities can serve as catalysts that mobilize the adolescent's proclivity for sensation-seeking and direct it toward potentially harmful actions.

Peer groups vary in the extent to which antisocial risk-taking plays a role in their social interactions. Some teenagers associate with peers who only occasionally engage in dangerous risk-taking, while others are part of antisocial peer groups heavily involved in one or more forms of illicit activities.[116] Yet, no sharp dichotomy typically exists between pro-social and anti-social peers. A broad range of adolescents are attracted to exciting activities that may be associated with physical and social risks. Thus, generally pro-social teenagers can sometimes instigate or participate in potentially harmful activities, just as anti-social adolescents also sometimes respond to peer influence to engage in socially desirable behavior.[117]

Most adolescents experiment with some mix of the risky behaviors described earlier. But whether a teenager engages in a particular form of risk-taking, and to what extent, is influenced by its availability and by the preferences of the peer community, which interact with broader cultural factors that can vary over time and across cultures. For example, teenage drinking and drug use have been more popular in some historic periods than others, and peer sub-communities may vary in their substance of choice. Criminal activity is also influenced by cultural factors. Criminologists credit the widespread availability of guns as a key contributor to the spike in juvenile homicide rates in the late 1980s and early 1990s.[118] Disputes that were settled through fistfights in an earlier era were resolved with guns in the late twentieth century.

Only recently has research directly shed light on how the interaction between the individual adolescent and the peer group facilitates participation in risky activities. A study by Jason Chein and colleagues found that the presence of peers leads to increased risk-taking by adolescents but not adults. The study also found that peer presence

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116. Chris Melde & Finn-Aage Esbensen, *Gang Membership as the Turning Point in the Life Course*, 49 *CRIMINOLOGY* 513 (2011).

117. Sarah Fischer & Gregory T. Smith, *Deliberation Affects Risk Taking Beyond Sensation Seeking*, 36 PERSONALITY & INDIV. DIFFERENCES 527, 527-37 (2004).

118. Zimring & LaQuer, *supra* note 46.

activated the brain regions associated with the anticipation of potential rewards in adolescents, suggesting that greater neural activation in the brain's reward centers is associated with increased risk taking. Importantly, in this study, subjects were merely *told* that they were being observed by peers from another room; the responses in brain activity and risk-taking were not due to actual peer pressure.[119] Other studies from this team of scientists have shown that, even in the absence of opportunities to engage in risk-taking, the presence of peers activates adolescents' reward centers and increases adolescents' preference for immediate rewards.[120]

It is possible to hypothesize with some confidence the dynamic between individual adolescents and peers that leads to risky activities in real-world settings when we consider the following: a) normative adolescents are particularly susceptible to peer influence due to heightened sensitivity in the social brain; b) peers collectively constitute the primary component of social context for the individual adolescent; and c) those peers themselves typically are sensation-seeking adolescents who are prone to acting impulsively under conditions of emotional arousal and whose sensitivity to rewards is activated in the peer group context. In combination, it is unsurprising that the interaction among adolescent peers can be volatile, as one or more teenager serves as an active catalyst, encouraging others to participate in risky behavior that perhaps none would undertake on his or her own.

This dynamic interaction between individual and peers plays out against a backdrop in which opportunities to engage in risky activities vary, as described above. The patterns of risk-taking varies with age; for example, fifteen-year-olds drink alcohol less than twenty-year-olds. It also varies with parental norms and supervision, and by neighborhood, school setting and other factors that determine whether, how, and if sensation-seeking adolescents will likely act on their impulses.

It is well established that risk-taking declines as individuals mature. Most forms of risky behavior peak in late adolescence and early

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119. *See* Chein et al., *supra* note 27.

120. *See* Ashley R. Smith et al., *Age Differences in the Impact of Peers on Adolescents' and Adults' Neural Response to Reward*, 11 DEV. COGNITIVE NEUROSCIENCE 75 (2015); Alexander Weigard et al., *Effects of Anonymous Peer Observation on Adolescents' Preference for Immediate Rewards*, 17 DEV. SCI. 71 (2014).

adulthood:[121] a trend that is observed across cultures varying in their social, political, cultural, and economic contexts.[122] This pattern likely reflects the reality that many forms of risky behavior are driven by the interaction of an immature individual and a social context of peers who encourage risk-taking.[123] As adolescents mature, their propensity for sensation-seeking declines and the brain's executive functions improve, along with communication between the pre-frontal cortex and emotional centers of the brain. This maturation process results in better emotional regulation and behavioral control in arousing contexts, reducing impulsivity and the inclination to engage in risk-taking, including criminal activity. Importantly, this developmental process toward maturity proceeds in most adolescents alongside his peers such that the individual's social context changes as his peers also mature; he is no longer surrounded by sensation-seeking individuals, inclined, as he was, to make impulsive choices when emotionally aroused.[124]

A key insight of this analysis is that the primary exogenous influence on normative adolescent risk-taking is other adolescents, who as individuals are themselves inclined toward risk-taking, and who collectively constitute the main component of the teenager's social context. As individual adolescents mature, they become less susceptible to peer influence, less inclined toward sensation-seeking, and less impulsive; this maturation process also diminishes the individual's role as part of a risk-promoting peer context. Thus, each adolescent is both an individual maturing into adulthood who is becoming less inclined toward risk taking and a part of the social context that is becoming less facilitative of risk-taking due in part, as discussed below, to the assumption of work and relationship responsibilities.[125]

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121. Steinberg, *supra* note 12.

122. *See* Duell et al., *supra* note 75.

123. *See, e.g.*, Kathryn C. Monahan, Lawrence Steinberg, & Elizabeth Cauffman, *Affiliation with Antisocial Peers, Susceptibility to Peer Influence, And Desistance from Antisocial Behavior During the Transition to Adulthood*, 45 DEV. PSYCHOL. 1520 (2009).

124. Sweeten, Piquero & Steinberg, *supra* note 81, at 934-936.

125. Research indicating low rates of exposure to delinquent peers in early adolescence, increasing rates in middle and late adolescence and declining rates thereafter is consistent with this point. Mark Warr, *Age, Peers and Delinquency* 31 CRIMINOLOGY 17, 17-40 (1993). Early adolescents as individuals are developmentally less inclined toward antisocial behavior than older teens; thus the peer group of delinquent teens is small.

B. Adolescent Criminal Activity and Social Context

In conversations about crime prevention and public protection, juveniles are usually treated as a sub-category of offenders—a group that offends at high rates due to adolescent immaturity. But most adolescent involvement in criminal activity has more in common with teenage drinking, unsafe sex and car racing than with the criminal choices of adult offenders. For our purposes, it is more useful to view juvenile offending as a form of adolescent risk-taking than as a discrete form of antisocial behavior. It is often observed that age eighteen is the peak age for involvement in criminal activity, and that the crime rate falls steeply after the early twenties.[126] Other risky behavior follows a similar pattern, and developmentalists generally think the same biological and psychological mechanisms underlie criminal activity as other forms of risk-taking.[127] Thus, juvenile offending often may be attributed to youths acting upon a developmentally normative drive toward novel, exciting experiences. In a facilitative social context, adolescents direct their drive for sensation and risk toward anti-social or delinquent behaviors.

Like other forms of risk-taking in adolescence, criminal activity involves a dynamic interaction between the still-maturing teenager and his or her social context. As is true with other risk-taking, social context can deter or facilitate anti-social behavior. Thus, authoritative parents can provide structure and supervision for their children that reduce the risk of youthful offending, while disengaged parents likely perform no such deterrent function. Indeed, research suggests that greater parental monitoring is associated with longitudinal decreases in delinquency and aggression among young adolescents, regardless of affiliations with delinquent peers.[128] Neighborhoods also vary as social contexts for offending. In low-crime neighborhoods, non-criminal residents perform an

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126. Manuel Eisner, *Crime, Problem Drinking, and Drug Use: Patterns of Problem Behavior in Cross-National Perspective*, 580 ANNALS AM. ACAD. POL. & SOC. SCI. 201, 204 (2002); Sweeten, Piquero & Steinberg, *supra* note 81, at 931-934. Scott, Bonnie & Steinberg, *supra* note 66.

128. Julia A. Graber et al., *A Longitudinal Examination of Family, Friend, and Media Influences on Competent Versus Problem Behaviors Among Urban Minority Youth*, 10 APPLIED DEV. SCI. 75, 80-81 (2006).

informal monitoring function and may discourage criminal activity simply by being out and about on the streets and sidewalks and in the parks.[129] In high-crime neighborhoods, in contrast, residents may stay indoors out of fear for their safety, providing greater opportunity for criminal activity.[130] Neighborhood conditions can also reinforce both anti-social behaviors and psychological traits such as impulsivity. Research has linked community violence to disrupted behavioral control[131] and perpetual hyper-arousal among youth.[132] Further, dangerous environments can teach youth that violence is an effective method of problem solving, and therefore violence and delinquency become learned behaviors.[133] For individuals living in high-crime neighborhoods who feel chronically threatened, carrying a gun and acting reflexively or impulsively may be adaptive behaviors. As suggested above, schools also can be safe and supervised educational settings, or environments in which adolescents, gathered together in close proximity for extended periods, are subject to few exogenous constraints and many temptations to engage in antisocial behavior. Further, the extent to which youth are engaged in educational pursuits and feel connected to their school correlate with long-term effects on adolescent delinquency and substance use.[134]

As we have indicated, peers constitute the element of social context most likely to activate an individual adolescent's reward-seeking tendencies, and typically peers are the most important contextual contributor to risk-taking. Research confirms that affiliation with anti-social peers is the factor most predictive of juveniles' involvement in

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129. Robert J. Sampson, Stephen W. Raudenbush & Felton Earls, *Neighborhoods and Violent Crime: A Multilevel Study of Collective Efficacy for Children*, 277 *SCI.* 918, 918-919 (1997).

130. *Id.*

131. *See generally* Michael R. Cooley-Quille et al., *Emotional Impact of Children's Exposure to Community Violence: A Preliminary Study*, 34 J. AM. ACAD. CHILD & ADOLESCENT PSYCHIATRY 1362 (1995); Patrick Fowler et al., *Community Violence: A Meta-Analysis on the Effect of Exposure and Mental Health Outcomes of Children*, 21 DEV. & PSYCHOPATHOLOGY 227, 227-59 (2009); Robert J. Sampson, Stephen W. Raudenbush & Felton Earls, *Neighborhoods and Violent Crime: A Multilevel Study of Collective Efficacy for Children*, 277 *SCI.* 918 (1997).

132. W. Cody Wilson & Beth S. Rosenthal, *The Relationship Between Exposure to Community Violence and Psychological Distress Among Adolescents: A Meta-Analysis*, 18 VIOLENCE & VICTIMS 335 (2003); Fowler et al., *supra* note 131.

133. Fowler et al., *supra* note 131.

134. Yibing Li et al., *The Role of School Engagement in Preventing Adolescent Delinquency and Substance Use: A Survival Analysis*, 34 J. ADOLESCENCE 1181 (2011).

criminal activity.[135] Even adolescents who are not inherently delinquent or anti-social are more likely to engage in anti-social behaviors when they socialize in groups of teens in unstructured, unsupervised settings; this finding highlights the important role of context in facilitating adolescent risk behavior.[136] In this section, we examine how anti-social peer affiliation develops and probe the interaction between the individual and his or her adolescent peer group as that interaction relates to offending. This interaction can shed some light on the functioning of juvenile gangs. It also informs our understanding of the role of peers in the trend toward desistence in early adulthood.

1. Affiliation with Anti-Social Peer Groups

Although most adolescents engage in risk-taking, including some forms of criminal activity, most do not associate with peers whose risk-taking takes the form of chronic or serious criminal activity. Why do some adolescents tend to affiliate with anti-social peers while others find friends less likely to get into serious trouble? This question has been the focus of some research in recent years; not surprisingly, it appears that several factors contribute to peer group affiliation.

First, the tendencies and traits of the individual adolescent play a role in peer associations. Some teens are more inclined toward sensation-seeking and more impulsive than the norm, and they may be attracted to the extreme risk-taking activities of anti-social peers; others may lack the social skills to affiliate with more desirable peer groups. Studies of peer group formation show that some teenagers resort to anti-social peer groups because they are rejected from higher-status crowds.[137] Of course, intense sensation seekers might associate with peer groups that pursue extreme sports or other dangerous activities, but some will likely be attracted to a peer group that engages in criminal activity if such a group is available or if access to more pro-social groups is constrained.

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135. Sweeten, Piquero & Steinberg, *supra* note 81.

136. Sonja E. Siennick & D. Wayne Osgood, *Hanging Out with Which Friends? Friendship-Level Predictors of Unstructured and Unsupervised Socializing in Adolescence*, 22 J. RES. ADOLESCENCE 646, 647-48 (2012).

137. ROBERT B. CAIRNS & BEVERLEY D. CAIRNS, LIFELINES AND RISKS: PATHWAYS OF YOUTH IN OUR TIME 130-46 (1994).

Parents play an important, if indirect, role in their children's peer group associations. Research has found that parents' values and preferences about their children's associations seem to influence adolescent peer group affiliations.[138] If parents are distant and fail to monitor their children, or if parents themselves endorse antisocial or criminal norms, it is more likely that teenagers will affiliate with deviant peer groups.[139] One study found evidence that parents fostered certain traits or behavior patterns in their children, which then predicted peer group affiliation.[140] Moreover, parents' influence on peer affiliation likely predates adolescence. Snydor and colleagues found parental failure to discipline their children's anti-social behavior to be a precursor to association with deviant peers.[141] Parents also determine the neighborhood, community, and school in which the teen will live, which determine the peer groups that are *available* for affiliation. Of course, parents themselves may have few residential options due to economic and social constraints. These limitations can restrict poor families to high-crime neighborhoods where delinquent peers are ubiquitous. In this situation, the adolescent's social context may offer few pro-social peer group options.

This last point is important in understanding why adolescents in some neighborhoods and communities are far more likely to associate with deviant peers than teenagers in other settings. In some neighborhoods, most male peer groups are committed to involvement in criminal activity. In this environment, an adolescent's realistic options may not include pro-social peer groups. Neighborhood geography also may limit the choices available to individual teens; urban teenage gang members are likely to live in close proximity to one another. The alternative of avoiding peer affiliation altogether is unattractive to most teenagers, although it may appeal to parents seeking to protect their children from gang involvement.

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138. B. Bradford Brown, Nina S. Mounts, Susie D. Lamborn & Laurence Steinberg, *Parenting Practices and Peer Group Affililiation in Adolescence*, 64 CHILD DEV. 467 (1993).

139. Several early studies found a link between affiliation with deviant peers (usually involved in drug use) and parental modeling or disengagement. *See generally* Denise B. Kandel & Kenneth Andrews, *Processes of Adolescent Socialization by Parents and Peers*, 22 INT'L J. ADDICTIONS 319 (1987); E.R. Oetting & Fred Beauvais, *Peer Cluster Theory, Socialization Characteristics, and Adolescent Drug Use: A Path Analysis*, 34 J. COUNSELING PSYCHOL. 205 (1987).

140. Brown, Mounts, Lamborn, & Steinberg, *supra* note 138.

141. J. Snyder, T.J. Dishion & G.R. Patterson, *Determinants and Consequences of Associating with Deviant Peers during Preadolescence and Adolescence*, 6 J. EARLY ADOLESCENCE 20 (1986).

Further, in high-crime neighborhoods, peer group affiliation may be deemed a source of security as well as excitement and camaraderie. Hostility among adolescent peer groups may leave the unaffiliated youth vulnerable to attack and harassment, as gang membership provides a defense against attacks by other gangs.[142] The upshot is that adolescents in high-crime neighborhoods may be very limited in their peer group options. They may affiliate with deviant peers as "the only game in town."

2. Peer Group Influence and Juvenile Offending

Adolescents' susceptibility to peer influence and desire to please peers can influence juvenile offending in two ways. First, adolescents offend in groups at substantially higher rates than do adults.[143] The impact of peers on one another in a group setting likely enhances the salience of potential rewards associated with certain behaviors, leading to emotional arousal and sensation-seeking, which in turn may overwhelm the adolescent's still maturing ability to control impulsive behavior. Thus, the prospect of acquiring money or vanquishing a rival gang that poses a threat becomes more exciting in the peer context. Each youth likely is also sensitive to the approval of others in the group. As the planning of a crime proceeds, withdrawal by individual youths may be very costly, leading to rejection and even exclusion from the peer group. Moreover, in his emotionally aroused state, the adolescent is more likely to focus on the potential short-term rewards of the criminal act, while paying scant attention to the potential downside.

The power of peer influence on the individual adolescent operates even without overt peer pressure or even peer presence.[144] Thus, a second form of peer influence occurs if a teenager acts with the goal of positively impressing his peer group. An adolescent seeking peer approval might act alone to steal something in anticipation of his friends' approving response. This variation is important for two reasons. First, it suggests that

142. Charles M. Katz et al., *Understanding the Relationship Between Violence Victimization and Gang Membership*, 39 J. CRIM. JUST. 48 (2011) ("[T]he cohesiveness and solidarity among gang members . . . result[s in] . . . members' perception that the gang provides valuable protection").

143. Zimring & LaQueur, *supra* note 46.

144. Chein, *supra* note 27 (describing study in which subjects were told that peer was watching them perform task; adolescents took more risks than adults).

anticipated peer response can influence adolescent behavior, even when peers are not present.[145] Second, it suggests that identifying an adolescent as a leader (or initiator of criminal activity) or follower may sometimes not be a meaningful distinction. An adolescent who acts to impress antisocial peers may simply be conforming to peer group expectations.

We can only tentatively describe the actual process through which individual adolescents in an anti-social peer group plan and execute a criminal offense; not surprisingly, field research has not been undertaken. However, the body of developmental knowledge that we have described can inform our understanding of the interaction between individuals and peer groups in this context. The following scenario comports well with developmental knowledge: Several friends are hanging out on a Friday evening when one suggests robbing the local convenience store. As the group discusses the idea, they become excited at the prospect of the cash they will acquire in the hold-up; several advocate eagerly for the plan and others join in the enthusiasm; most do not consider the potential risks they may face, including the risk of apprehension or the possibility that the store clerk will be armed and will fire in self-defense; most also do not think about the cost of a delinquency adjudication to their future lives, and those who do consider the potential risks may decide that the benefits of the act (e.g., peer approval, earning money, having fun) outweigh the potential costs. Any youth who has qualms about the plan is silent, not wanting to earn the anger or ridicule of his friends.

In situations of gang rivalry, involvement in criminal activity may implicate more complex responses in adolescent gang members than the reward-seeking impulses associated with juvenile offenses aimed at financial gains.[146] When adolescent gangs compete with one another for territorial dominance, individual members of each gang are likely emotionally aroused by the prospect of the gains associated with victory over the rival. A rival gang poses a threat of physical harm, but threats, like rewards, can be emotionally arousing.[147] The dual sources of

145. *Id.*

146. For a comprehensive analysis of gang membership and behavior in a developmental perspective, see TERENCE P. THORNBERRY ET AL., GANG AND DELINQUENCY IN DEVELOPMENTAL PERSPECTIVE (2003).

147. Cohen, et. al., *supra* note 9; Amanda E. Guyer et al., *A Developmental Examination of Amygdala Response to Facial Expressions,* 20 J. COGNITIVE NEUROSCIENCE 1565, 1565-82 (2008)

emotional arousal experienced by gang members may escalate emotional responses, creating in individual members of each gang a hyper-vigilance to anticipated attack and urgent desire to preempt rivals in attaining territorial goals. In planning a gang activity, individual members are likely to reinforce one another in their excitement about the prospect of attaining the goal, with little immediate attention to the risk of injury or death inherent in the confrontation. But as the confrontation unfolds, the threat of harm becomes highly salient, triggering quick responses. This dynamic interaction between the individual adolescent and his peer group in a hostile, threatening context invites impulsive responses that often involve violence.[148]

3. Social Context and Limits on Exit

The Supreme Court in its juvenile sentencing opinions has underscored a final point about social context and juvenile offending. A juvenile by virtue of his status as a legal minor cannot escape his family, neighborhood, or his limited options for peer associates.[149] Unlike an adult, who (theoretically, at least) can leave the temptation of a high-crime neighborhood, a juvenile cannot extricate himself.[150] Thus, the adolescent whose circumstances place him in a social context that encourages involvement in crime does not have the option of moving to a community in which he can enjoy the benefit of authoritative parents, an enriched educational setting, a safe neighborhood, and pro-social peers—elements of social context that would reduce the likelihood that he will get involved in serious crime.

(compared to adults ages 21-40, adolescents ages 9-17 evinced greater activation to fearful faces in the amygdala, which is responsible in part for processing emotional information); Jeffrey M. Spielberg et al., *Exciting Fear in Adolescence: Does Pubertal Development Alter Threat Processing?*, 8 DEV. COGNITIVE NEUROSCIENCE 86, 86-95 (2014).

148. Katz et al., *supra* note 142.

149. *See* Graham v. Florida, 560 U.S. 48 (2010); Miller v. Alabama 567 U.S. 460 (2012).

150. Scott & Steinberg, *supra* note 17.

4. Social Context and Desistence from Criminal Activity.

It is well established that criminal offending increases through adolescence, peaks between ages seventeen and eighteen, and declines sharply thereafter.[151] This pattern is similar to that observed for other forms of risk-taking, although the peak age varies somewhat for different types of risky behavior.[152] Further, the factors contributing to the decline in other risk-taking in late adolescence and young adulthood also may drive desistence from criminal activity. Most importantly, desistence from crime is correlated with the declining susceptibility to influence from antisocial peers. Substantial evidence supports that the decline in affiliation with anti-social peers as adolescents transition to adulthood is the most important contributor to the declining rate of participation in crime post-adolescence.[153]

Most adolescents desist from offending (and other forms of risk-taking) through a process that is linked to maturation; as the individual adolescent and his peers mature, the dynamic interaction that propelled juvenile offending weakens. Reward-seeking and extreme sensitivity to peers, developmentally normal tendencies in adolescence, decline with maturity: as the individual ages, he or she is less prone to emotional arousal at the prospect of criminal activity with peers.[154] At the same time, decision-making improves as the young adult becomes less impulsive and the executive functions of the brain operate more effectively, facilitating the regulation of emotions and consideration of future consequences.[155] As noted earlier, because this maturation is typical of most adolescents, both the individual and his peers (the most important exogenous contributor to adolescent involvement in crime) are changing simultaneously. The individual becomes less inclined to offend, and the peer group is less

151. ELIZABETH S. SCOTT & LAURENCE STEINBERG, RETHINKING JUVENILE JUSTICE 52-53 (2008).

152. *See generally* Ivy N. Defoe et al., *A Meta-Analysis on Age Differences in Risky Decision Making: Adolescents Versus Children and Adults*, 141 PSYCHOL. BULL. 48 (2015); Teena Willoughby et al., *Examining the Link Between Adolescent Brain Development and Risk Taking from a Social-Developmental Perspective*, 83 BRAIN & COGNITION 315 (2013); Scott, Bonnie & Steinberg, *supra* note 66.

153. Sweeten, Piquero & Steinberg, *supra* note 81.

154. *See* discussion *supra* Part I.A.1 and Part II.B.2.

155. *See* discussion *supra* Part I.B.

likely to play its facilitative role of inducing emotional arousal and promoting criminal activity. The excitement associated with criminal activity declines while the potential costs and risks become more salient.[156]

As adolescents mature into adulthood, social context changes in other ways that likely contribute to desistence from offending. Robert Sampson and John Laub have argued that employment and spousal roles in adulthood encourage desistence from involvement in criminal activity.[157] For most adults, these conventional roles provide structure and a social context that limits opportunities for risk-taking. The time demands and routines of work and family responsibilities make participation in criminal activity more costly. This account is compatible with the rationale for desistence that emphasizes the impact of adolescents' normal maturation on both the individual propensity toward offending and the peer group's catalytic role. The conventional adult roles that bring stability to the lives of formerly anti-social youth require maturity; sensation-seeking, impulsive adults are unlikely to be successful as employees and life partners. Moreover, as peers themselves mature and assume adult roles, social pressure to engage in criminal activity likely declines and mainstream social norms encourage responsible fulfillment of role obligations.

C. Non-Normative Antisocial Behavior in Adolescence

Not all offending by juveniles can be explained as a product of the interaction between immature, but developmentally normative, adolescents and their peers, who are themselves immature teenagers. Some individuals are inclined toward serious anti-social behavior in childhood, differing in important ways from teens whose involvement in criminal activity begins in adolescence. Some early-onset offenders may also desist as they mature,[158] but normative brain development in adolescence, by definition,

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156. Elizabeth Shulman, Kathryn Monahan, & Laurence Steinberg, *Severe Violence During Adolescence and Early Adulthood and Its Relation to Anticipated Rewards and Costs*, 88 CHILD DEV. 16, 17 (2017).

157. JOHN LAUB & ROBERT SAMPSON, CRIME IN THE MAKING: PATHWAYS AND TURNING POINTS THROUGH LIFE 6-24 (1993).

158. Rolf Loeber & Thomas J. Dishion, *Early Predictors of Male Delinquency: A Review*, 94 PSYCHOL. BULL. 68, 78-81 (1983). Terrie E. Moffitt & Avshalom Caspi, *Childhood Predictors*

does not contribute to their early maladaptive behavior. Moreover, although most juvenile offending declines sharply beginning in late adolescence, some individuals persist in criminal pursuits into adulthood;[159] either they have failed to mature or maturation has not led them to desist from criminal activities. Although this category of offenders is small compared to normative juveniles, it includes the most serious offenders who cause the most social harm.[160]

Comprehensive examination of early-onset offenders and "life-course-persistent"[161] offenders is beyond the scope of this Article. Nonetheless, brief consideration of these individuals, and how their involvement in crime differs from that of normative adolescents, is in order. Developmentalists and criminologists agree that several factors contribute to serious antisocial behavior in childhood, including hyperactivity and attention-deficit disorders, other neurological deficits, learning disabilities, and inadequate or abusive parenting.[162] Early-onset offenders are often children with complex problems whose parents are incapable of providing adequate supervision and the support needed to overcome the challenges they face. Indeed, even adequate parents may be unsuccessful in dealing with these children.[163] Thus, the source of their antisocial behavior may be endogenous, or it may be the product of an interaction of individual factors and childhood social context. Unlike normative adolescent offenders, however, the individual factors are not primarily normal developmental influences, and peers do not constitute the primary influence of social context. But, when these children persist in their anti-social behavior into adolescence, their individual deficits may combine with normative influences associated with adolescence, making them particularly vulnerable and likely to engage in criminal activity.

Some adolescent delinquents become adult criminals, and their

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Differentiate Life-Course-Persistent and Adolescence-Limited Antisocial Pathways Among Males and Females 13 DEV PSYCHOPATHOL 355, 367-79 (2001).

159. Terrie E. Moffitt. *Adolescence-Limited and Life-Course-Persistent Antisocial Behavior: A Developmental Taxonomy* 100 PSYCH REV. 674, 677 (1993).

160. *Id.*

161. *Id.* Moffitt offers a taxonomy in which most juvenile offenders are "adolescence-limited"; their offending begins and ends in adolescence. A small group, however, are "life-course persistent" offenders, whose antisocial conduct begins in childhood and continues into adulthood.

162. *Id.* at 679-682.

163. *Id.* at 682.

offending can no longer be attributed to normal developmental immaturity and the predictable influence of normative peers. This group includes early onset offenders, but also individuals who began to offend in adolescence.[164] In the latter case, as we discuss below, the individual's life trajectory may have been shaped by his interaction with the justice system, and by sanctions that impede normal development. In general, however, the impulsive, sensation-seeking behavior of the adult criminal will be taken to represent individual characterological deficits and not residual adolescent immaturity from which the individual is likely to emerge.[165] For our purposes, the important point is that we currently lack the tools to distinguish accurately during adolescence the normative juvenile offender who likely will mature out of his or her tendency to get involved in crime from the emerging career criminal or the psychopath.[166] Because the vast majority of adolescents who violate the law do not become chronic adult criminals, information about an offender's adolescent misbehavior is seldom predictive of adult criminality.

III. CORRECTIONAL PROGRAMS AS SOCIAL SETTINGS

To this point, we have focused on how the dynamic interaction between the still-maturing adolescent and his or her peers (and other environmental influences) contributes to risk-taking, including criminal activity. Beyond this, the extreme sensitivity of adolescents to their social context has a broader impact on their development to adulthood: the individual's interaction with her social context during adolescence can determine whether he or she accomplishes developmental tasks essential to successful maturation. For adolescents in the justice system, correctional facilities and programs constitute this social context and can

164. Rolf Loeber & Magda Stouthamer-Loeber, *Development of Juvenile Aggression and Violence: Some Common Misconceptions and Controversies*, 53 AM. PSYCHOLOGIST 242 (1998).

165. Scott and Steinberg, *Blaming Youth*, *supra* note 17.

166. Jennifer L. Skeem & Elizabeth Cauffman, *Views of the Downward Extension: Comparing the Youth Version of the Psychopathy Checklist with the Youth Psychopathic Traits Inventory*, 21 BEHAV. SCI. & L. 737 (2003); Gina M. Vincent et al., *Subtypes of Adolescent Offenders: Affective traits and Antisocial Behavior Patterns*, 21 BEHAV. SCI. & L. 695 (2003). *But see* Randall T. Salekin, *Psychopathy and Recidivism From Mid-Adolescence to Young Adulthood: Cumulating Legal Problems and Limiting Life Opportunities*, 117 J. ABNORMAL PSYCHOL. 386 (2008).

have a critical impact on whether they successfully navigate the transition to productive adulthood.

Developmental psychologists explain that adolescence is a formative period of psychological and social development, during which an individual's experience can shape the trajectory of his or her future life. During adolescence, individuals begin to acquire skills and capacities necessary for successful maturation and the assumption of conventional adult roles of employee, spouse or intimate partner, and citizen.[167] For most adolescents, this maturation process depends on several conditions in the social context that provide "opportunity structures"[168] for healthy development. Two of these conditions represent the obverse of the elements of social context that promote antisocial risk-taking: the presence of an authoritative adult who cares about the youth and can provide guidance and structure,[169] and membership in a pro-social peer group (and minimal influence of antisocial peers). A third important condition of a healthy social context, more indirectly implicated in risk-taking, is participation in meaningful activities that promote autonomous decision-making and critical thinking. The accomplishment of essential developmental tasks in adolescence typically involves reciprocal interaction between the individual and a social context that provides these conditions.[170]

In recent years, work in developmental neuroscience indicating that adolescence is a heightened period of neural plasticity has buttressed this view of adolescence as a formative period in psychological development.[171] "Plasticity" refers to the capacity of the brain to change with experience. Neuroscientists distinguish between two types of plasticity: "developmental plasticity" permits large-scale transformations in brain circuitry, including the development of new circuits and the

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167. He Len Chung, Michelle Little, & Laurence Steinberg, *The Transition to Adulthood For Adolescents in the Juvenile Justice System: A Developmental Perspective*, ON YOUR OWN WITHOUT A NET: THE TRANSITION TO ADULTHOOD FOR VULNERABLE POPULATIONS 68-91 (W. Osgood et al., eds., 2005).

168. *See* SCOTT & STEINBERG, *supra* note 151, at 58, 213.

169 For many youths, this adult is a parent, but another adult can also fulfill this role. *Id.* at 56

170. *Id.* at 56-57.

171. Adriana Galván, *Insights about Adolescent Behavior, Plasticity, and Policy from Neuroscience Research*, 83 NEURON 262 (2014), http://linkinghub.elsevier.com/retrieve/pii/S0896627314005492.

disappearance of old, unnecessary ones, while "adult plasticity" only allows for minor modifications of existing brain circuits.[172] Adolescence is thought to be the last period of developmental plasticity.

Adolescence is a unique period of developmental plasticity in four important respects, all of which have implications for juvenile justice policy and practice.

First, adolescence is a second period of particularly heightened plasticity, the first being the first few years of life. It has long been known that the brain is particularly sensitive to the environment during the early years,[173] an observation that has understandably motivated much discussion about the importance of investing in high-quality prenatal and postnatal care, child care, and early education. More recent research has revealed that the brain undergoes a second burst of plasticity at adolescence.[174] Researchers only recently have begun to articulate the underlying mechanisms of this burst in plasticity, but several studies point to the impact of pubertal hormones on the brain as its likely trigger.[175] We have explained that adolescence is a time during which individuals are especially sensitive to the social environment; a response thought to be associated with puberty.[176] An important implication of this discovery is that the social context in which the adolescent spends time may have a more profound impact on his or her behavior than during childhood or adulthood. Not surprisingly, this knowledge has begun to inform discussions about the treatment of young people in the justice system.

Second, the brain regions that are thought to be especially plastic during adolescence are those involving the adolescent's response to reward and those involving the development of self-regulation.[177] As we

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172. The brain is always somewhat plastic—it would be impossible to learn new skills or acquire new information if it were not. Charles A. Nelson III & Margaret A. Sheridan, *Lessons from Neuroscience Research for Understanding Causal Links Between Family and Neighborhood Characteristics and Educational Outcomes*, *in* WHITHER OPPORTUNITY?: RISING INEQUALITY, SCHOOLS, AND CHILDREN'S LIFE CHANCES 27-46 (Greg J. Duncan & Richard J. Murnane eds., 2011).

173. *See* Spear *supra* note 63 at S10.

174. *See* Galván *supra* note 171.

175. Jiska S. Peper et al., *Sex, Steroids and Connectivity in the Human Brain: A Review of Neuroimaging Studies*, 36 PSYCHONEUROENDOCRINOLOGY 1101, 1102-03 (2011); Cheryl L. Sisk & Julia L. Zehr, *Pubertal Hormones Organize the Adolescent Brain and Behavior*, 26 FRONTIERS IN NEUROENDOCRINOLOGY 163, 169 (2005).

176. *See* Moffitt, *supra* note 159.

177. Kathrin Cohen Kadosh, David E.J. Linden, & Jennifer Y.F. Lau, *Plasticity During*

have explained, because the interplay between these brain regions is thought to play a crucial role in adolescent risk taking, experiences during adolescence have the potential to enhance or diminish normative development in the very parts of the brain implicated in criminal and other antisocial behavior. That is, experiences during this period have the potential to strengthen or weaken self-control, and to strengthen or weaken reward sensitivity.

Third, the heightened malleability of the adolescent brain is a dual-edged sword.[178] On the positive side, the susceptibility of the adolescent brain to positive influence makes the period one of great opportunity, during which individuals may be especially good candidates for rehabilitative interventions. On the negative side, however, the same plasticity that makes the brain susceptible to positive influence makes it vulnerable to toxic experiences. Thus, research has shown that adolescents are particularly vulnerable to addiction, especially responsive to stress, and more likely than at any other time to experience serious mental health problems.[179] One important implication of this is that residential and correctional facilities in which adolescents are placed are likely to have a profound impact on their psychological functioning and development. Harmful correctional experiences, such as exposure to violence or social isolation, are likely to be particularly damaging at this stage of life.

Finally, just as there is a significant increase in plasticity early in adolescence, there is a corresponding decrease during the transition from adolescence to adulthood. The fact that the brain becomes less plastic as individuals mature out of adolescence is now well-established although the mechanisms that trigger this loss of plasticity have yet to be identified. Nonetheless, it is likely that adolescence represents an especially formative period in brain development, and that major changes in the brain

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Childhood and Adolescence: Innovative Approaches to Investigating Neurocognitive Development,16 DEV. SCI. 574, 576 (2013); Lynn D. Selemon, *A Role for Synaptic Plasticity in the Adolescent Development of Executive Function*, 3 TRANSLATIONAL PSYCHIATRY e238, e231-e232 (2013).

178. Susan L. Andersen, *Trajectories of Brain Development: Point of Vulnerability or Window of Opportunity?*, 27 NEUROSCIENCE & BIOBEHAVIORAL REV. 3 (2003).

179. Lisa Eiland & Russell D. Romeo, *Stress and the Developing Adolescent Brain*, 249 NEUROSCIENCE 162 (2013); Ronald C. Kessler et al., *Lifetime Prevalence and Age-of-Onset Distributions of DSM-IV Disorders in the National Comorbidity Survey Replication*, 62 ARCHIVES GENERAL PSYCHIATRY 593 (2005); Nora Volkow & Ting-Kai Li, *The Neuroscience of Addiction*, 8 NATURE NEUROSCIENCE 1429 (2005).

become increasingly intractable with age. This creates special urgency to intervene during this period to promote positive psychological functioning.

The research on brain plasticity in adolescence underscores the important impact of juvenile correctional programs on individual maturation during a critical developmental stage. Thinking about correctional settings as social contexts for development during a period in which individuals are highly sensitive and responsive to that context provides a critical perspective from which to evaluate justice system facilities and programs. As we saw in Part II, negative conditions (or the absence of positive conditions) in the adolescent's social context can contribute to harmful risk-taking. Neglectful parents, antisocial peers, and schools and neighborhoods devoid of productive, engaging activities contribute to juveniles' involvement in crime. Some correctional settings are also likely to have a very negative impact. The social-context framework clarifies why prisons are widely viewed as toxic developmental settings.[180] The likelihood that the adolescent inmate will establish a relationship with an authoritative adult is negligible. Relationships between guards and prisoners typically are hostile and distant, and adult inmates are unlikely to care for and provide positive adult guidance to juvenile prisoners.[181] The adolescent prisoner may find himself surrounded by anti-social peers and adults, and often has a great deal of unstructured time in their company.[182] Educational and vocational programs in prison often are deficient and few are tailored to the needs of adolescents.[183] Not surprisingly, juveniles sentenced to prison have high recidivism rates.

This analysis clarifies that even though much juvenile offending is the product of the interaction of immature adolescents and a social context that promotes risk-taking, maturation and desistence are not inevitable.

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180. U.S. Department of Justice, Bureau of Justice Statistics, *Correctional Population in the United States, 1995* (1997); SCOTT & STEINBERG, *supra* note 151, at 208-13; Donna Bishop & Charles Frazier, *Consequences of Transfer*, in THE CHANGING BORDERS OF JUVENILE JUSTICE: TRANSFER OF ADOLESCENTS TO THE CRIMINAL COURT 254-164 (Jeffrey Fagan & Franklin E. Zimring, eds., 2000).

181. Juvenile prisoners are vulnerable to violent exploitation by older prisoners; alternatively, young inmates may be trained to become career criminals. SCOTT & STEINBERG, *supra* note 151; *see also* Jennifer Woolard et al., *Juveniles within Adult Correctional Settings: Legal Pathways and Developmental Considerations*, 4 INT'L J. FORENSIC MENTAL HEALTH 1, 9 (2012), http://www.tandfonline.com/doi/abs/10.1080/14999013.2005.10471209.

182. *Id.*

183. *See* Bishop & Frazier, *supra* note 180.

Given heightened brain plasticity during adolescence, social context plays a key role in whether juveniles successfully accomplish the developmental tasks necessary to make the transition to productive adulthood, and it can undermine as well as facilitate progress. Thus the correctional setting in which the juvenile is sanctioned can play an important role in determining the trajectory of his or her future life.[184] Programs that aim to facilitate desistence in young offenders and encourage their transition to productive adulthood will attend to the impact of the developing youth's social context and seek to provide the conditions for healthy development.

IV. LEGAL IMPLICATIONS OF THE INTERACTIVE FRAMEWORK

In this Part, we explore the importance of the interactive framework that we have developed in this Article for legal doctrine and policy aimed at sanctioning juveniles for their crimes and deterring juvenile crime. First, the framework powerfully reinforces constitutional principles under which juvenile offenders generally are deemed less culpable than adults, and more likely to desist from offending as they mature into adulthood. These principles, in turn, support a broad range of justice policies premised on juveniles' reduced culpability and greater potential for reform. Our analysis of the interaction between the individual youth and his or her social context provides an effective response to the skeptics who reject the importance of immaturity as a mitigating factor in criminal liability on the ground that many adolescents do not engage in serious criminal conduct. Second, our interactive framework clarifies the importance of social context as a legitimate, but limited, contributor to a theory of mitigation, and as such it offers a useful intervention in a longstanding debate among criminal law scholars.[185] We have shown that social context has a far narrower, but more direct, impact on adolescents' criminal choices than was proposed by advocates arguing generally that environmental deprivation based on " rotten social background" [186] reduces culpability.

184. *See* THORNBERRY, *supra* note 146, analyzing the impact of gang membership on the trajectory of a young gang member's life.

185. *See infra* Part IV.C.

186. Delgado, *"Rotten Social Background": Should the Criminal Law Recognize a Defense of Severe Environmental Deprivation?*," *supra* note 19.

Finally, we highlight the policy importance of social context in developing sanctions for juveniles that are likely to promote, and not undermine, healthy maturation and desistence from crime. In general, focusing on the interaction between maturing adolescents and their social context provides a more complete account of juvenile offending and desistence than a model that emphasizes only the immaturity of teenage brains.

A. Reduced Culpability and Potential for Reform

The Supreme Court in its juvenile sentencing opinions announced that "children are different," and cited studies of brain development in its conclusion that harsh criminal sentences that might be appropriate for some adult offenders are unconstitutional for juveniles under the Eighth Amendment.[187] The Court focused primarily on how the immaturity of adolescents can lead them to make impulsive, reckless decisions and engage in "heedless risk-taking;"[188] it also observed that, because their crimes are the product of immaturity, most juvenile offenders will reform as they mature into adulthood and should be given the opportunity to do so.[189] Culpability skeptics have challenged this analysis, pointing to the very serious crimes committed by the juvenile petitioners in the cases before the Court, and observing that few adolescents commit similar crimes.[190]

It is not our purpose to analyze whether Chris Simmons (who killed a neighbor, bound her, and threw her in a nearby river) was driven by factors associated with adolescent immaturity or by largely endogenous influences.[191] Instead, we propose that our interactive framework provides important confirmation of the Supreme Court's "children are different" principle and shows that the skeptics' critique targets a narrow and empirically incomplete version of the Court's mitigation analysis. Indeed,

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187. *Miller*, 567 U.S. at 480-81; *Graham*, 560 U.S. at 48; *Montgomery*, 136 S. Ct. at 73___.

188. *Miller*, 567 U.S.,at 471 (quoting *Roper*, 543 U.S. 551, 569 (2005)).

189. *Miller*, 567 U.S. 460; *Montgomery*, 136 S. Ct. at 735; *Roper*, 545 U.S. 551.

190. YAFFE, *supra* note 3; *Graham*, 560 U.S. at 112 (Thomas, J., dissenting); *Miller*, 567 U.S. at 513 (Thomas, J., dissenting).

191. Chris Simmons was the petitioner in *Roper v. Simmons*. The Supreme Court finding his death sentence unconstitutional did not focus on Simmons individually, but observed the difficulty in distinguishing between the juvenile who was "irretrievably depraved," from the adolescent whose crime represented transient immaturity. *Roper*, 543 U.S. at 553

the Court in its sentencing opinions underscored the importance of social context and adolescents' normative sensitivity to that context as a key feature of juvenile offenders' reduced culpability. In *Miller v. Alabama*, the Court stated that juveniles are "constitutionally different from adults for purposes of sentencing, [in part because] they are more vulnerable . . . to negative influences and outside pressures, including from their family and peers"; they have "limited control over their own environment," and "lack the ability to extricate themselves from horrific crime-producing settings."[192] In these words, the Court succinctly summarized its understanding that important dimensions of the reduced culpability of juveniles and of their potential for reform can be found both in their extreme sensitivity to social context (an endogenous developmental factor), and in that social context itself (an exogenous influence). Neither of these contributors to juvenile offending is substantially within the control of the juvenile.

This point deserves elaboration. Adolescents' sensitivity to social context, particularly to emotional arousal in the presence of peers, is endogenous, associated with development of the social brain after puberty. The adolescent's control over this aspect of development is no greater than her control over other aspects of brain development, including the inclination toward reward-seeking or the tendency to make impulsive choices when aroused. To the extent that normative developmental immaturity mitigates juveniles' criminal culpability, susceptibility to peer influence and sensitivity to social context are as salient as other endogenous influences on decision-making. Further, like the teenager's inclination toward reward-seeking, susceptibility to peer influence declines with maturation.[193] This susceptibility is one dimension of developmental change that supports the Supreme Court's conclusion that juvenile offenders have a greater potential for reform than their adult counterparts. In short, the endogenous features of brain development that make adolescents particularly sensitive to social context function similarly to other aspects of social-emotional brain development (such as reward seeking and impulsivity) to distinguish juvenile offenders from adults. In combination, these features play a key role in criminal choices and support

192. *Miller*, 567 U.S. at 471 (quoting in part Roper v. Simmons, 543 U.S. 551, 569-70 (2005)).
193. *See* Gardner & Steinberg *supra* note 47.

greater leniency toward juvenile offenders.

The Supreme Court also recognizes that juveniles often have little control over their social context and usually no ability to extricate themselves from a setting that facilitates criminal activity.[194] Children and adolescents do not choose their parents, neighborhoods, schools, or communities. Parents may be neglectful and provide little supervision; the neighborhood and school may be dangerous, with little positive structure and few prosocial activities; and available peers may be inclined toward antisocial behavior. These conditions, as Part II explained, create a social context that facilitates youthful involvement in criminal activity. But, as legal minors, teenagers living with these conditions are not free to move to a new neighborhood, enter a new school, or (usually) find prosocial peers with whom to associate. The upshot is that most youths have little ability to control or change a social context that may contribute to their offending. The Supreme Court, in finding social context itself to contribute to juveniles' reduced culpability, in effect recognizes its importance in facilitating teenage criminal behavior.

As skeptics of mitigation based on immaturity observe, endogenous developmental factors alone provide an inadequate basis for treating young offenders as a special category, because many adolescents do not commit serious crimes. Some critics of the recent science-based trend see juveniles as indistinguishable from adults when it comes to criminal liability,[195] apparently viewing antisocial behavior generally as motivated by the individual's deficient character. The Supreme Court, however, recognized that juveniles deserve more lenient treatment than adults, not only because of developmental traits and tendencies, but also because their social context, over which they have little control, impels them to offend. The interactive framework that we have offered strongly supports and elucidates the Court's position.

The Supreme Court's analysis draws on two conventional sources of mitigation under criminal law doctrine.[196] Mitigation applies to criminal

194. *Roper*, 543 U.S. at 553. This point is based on the analysis of two of the authors. Scott & Steinberg, *Less Guilty by Reason of Adolescence, supra* note 17.

195. Mark R. Fondacaro, *Rethinking the Scientific and Legal Implications of Developmental Differences in Juvenile Justice Research,* 17 NEW CRIM. L. REV. 404 (2014); YAFFE, *supra* note 3.

196. Scott & Steinberg, *Less Guilty by Reason of Adolescence, supra* note 17; Steinberg & Scott,

acts that reflect diminished decision-making capacity; like mental illness or intellectual disability, immaturity can be the source of deficiencies in decision-making. As we have explained, social and emotional factors associated with adolescent brain development can undermine teenagers' capacity for rational decision-making under some conditions. Mitigation also applies to acts that respond to exogenous coercive pressures; indeed, the defense of duress is based on the intuition that a defendant who offends under truly extraordinary pressure is not culpable at all. As our interactive model demonstrates, these sources of mitigation are uniquely interwoven in adolescent criminal choices. Normative endogenous vulnerabilities make teenagers particularly susceptible to exogenous pressures from which they may be unable to escape, leading to impulsive, short-sighted choices.

Our interactive framework also provides strong support for the Court's conclusion that adolescents should receive less punishment than adult counterparts due to their potential for reform. The biologically-based tendencies that contribute to juvenile offending change and diminish as adolescents mature into adulthood, reducing their inclination to engage in reward-seeking and make impulsive choices in response to social context. At the same time, key elements of the social context also change, as peers themselves mature and become less inclined to encourage risky peer group behavior. Unless the trajectory of normal development is derailed, individuals predictably will make the transition to non-criminal adulthood as they mature.

The Court applied its developmental framework in the juvenile sentencing opinions to young offenders facing the most severe criminal sanctions and the Court's holdings affect a small category of young offenders. But, as courts, legislatures and policymakers have recognized, the "children are different" principle applies broadly to the justice system's treatment of young offenders. Courts have cited *Miller* and other Supreme Court opinions in decisions that have prohibited the use of sentences imposed on juveniles under adult enhanced- sentencing schemes,[197] and have excluded juvenile sex offenders from sex offender

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Blaming Youth, *supra* note 17.

197. Scott et al., *supra* note 2, at 703. *See* United States v. Howard, 773 F.3d 519, 528 (4th Cir. 2014).

registries.[198] A few courts have prohibited the use of *any* mandatory minimum sentence for a juvenile.[199] Legislatures also have adopted the court's developmental principles in creating special parole regulations for juvenile offenders.[200] In recent years, state regulators as well have embraced developmental principles in responding to juvenile crime, implementing policies that recognize the unique attributes of young offenders and aim to shape their development to adulthood in a positive direction.[201] The upshot is that our interactive framework, in clarifying the dynamic relationship between the developing adolescent brain and social context, reinforces the developmental approach to juvenile crime that has emerged in the past decade.

B. "Severe Environmental Deprivation" Revisited

In the 1970s and 1980s, criminal law scholars and judges debated whether a defendant's impoverished background served to mitigate criminal responsibility.[202] Some scholars argued that offenders who have experienced severe socio-economic deprivation are less culpable than other offenders and deserve less (or no) punishment, because deprivation excuses or mitigates criminal responsibility. Other scholars argued against this position, on the ground that an offender's impoverished background is simply not the kind of condition that reduces liability under conventional criminal law principles.

Richard Delgado, the leading proponent of the severe environmental deprivation (SED) defense, points to the reality that a large percentage of offenders come from deprived social backgrounds. On the basis of this correlation, he posits that poverty causes some individuals to commit crimes.[203] On Delgado's view, SED can constrain the criminal actor's free

198. Scott et al., *supra* note 2, at 709. *See, e.g.,* In re C.P., 967 N.E.2d 729, 732 (Ohio 2012); State v. Dull, 351 P.3d 641, 648-50, 660 (Kan. 2015); C.P., 967 N.E.2d at 740-41; In re J.B., 107 A.3d 1, 18-20 (Pa. 2014).

199. Scott et al., *supra* note 2, at 676. *See, e.g.,* State v. Lyle, 854 N.W.2d 378, 400 (Iowa 2014); State v. Ragland, 836 N.W.2d. 107, 122 (Iowa 2013).

200. *See* CAL. PENAL CODE §§ 3041, 3046, 3051, 4801 (West 2016). A similar statute was adopted by Washington State in 2014. *See* WASH. REV. CODE ANN. §10.95.030 (West 2016).

201. National Research Council, *supra* note 94, at 162.

202. *See* discussion of scholarly debate, *supra* notes 17 and 18.

203. *See* Delgado, *Rotten Social Background*, *supra* note 19, at 10.

choice as effectively as conventional sources of exculpation and therefore can be accommodated within criminal law doctrine. Delgado describes aspects of living in poverty that contribute to stress and anger in individuals; these environmental influences include inadequate schools, unemployment, substandard housing, other living conditions and a social context that contributes to an "alternative value system."[204] He argues that these factors in combination could seriously undermine behavioral controls, leading the individual to engage in criminal conduct. On Delgado's view, the inclination to commit crime is a pathology caused by poverty.[205]

Other scholars have rejected the argument that economic deprivation excuses or mitigates criminal conduct.[206] Stephen Morse has pointed out that causation is a capacious concept and that behavior, including criminal acts, can be traced to many causal factors. On Morse's view, even if poverty contributes to offending in a causal sense, that alone is insufficient to diminish an offender's criminal liability because deprivation does not impede the individual's capacity for rational reflection in making choices in a way that affects criminal responsibility. Nor does the experience of living in poverty create an irresistible compulsion to offend, or make the actor facing a "hard choice" (perhaps made harder by conditions of deprivation) incapable of choosing *not* to engage in criminal conduct.[207] Thus, offenders who have experienced economic deprivation simply cannot legitimately claim a defense based on conventional exculpatory principles of criminal law.

While SED has interested scholars and advocates, and is sometimes described in passing in treatises,[208] it has had little impact on the law.[209] As

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204. *Id.* at 30.

205. As Delgado explains, "The kind of pent-up rage and despair that can result from living in a crowded, violent neighborhood can cause an explosion of violence just as disordered brain circuitry can." *Id.* at 76.

206. *See* Morse, *Deprivation and Desert*, *supra* note 20. *See also* Mythri Jayaraman, *Rotten Social Background Revisited*, 14 CAP. DEF. J. 327 (2002). *See also infra* note 211 and accompanying text.

207. Morse, *supra* note 20.

208. *See, e.g.*, JOSHUA DRESSLER, CASES AND MATERIALS ON CRIMINAL LAW 725-28 (4th ed. 2007).

209. According to Morse, no legislature and few courts have even considered the defense. Morse, *supra* note 20, at 170.

Delgado acknowledged in 2011, no state has adopted a defense of extreme economic deprivation.[210] This is not surprising, perhaps. For both conceptual and practical reasons, SED is a hard sell. Courts may fear that applying and limiting the defense would be extraordinarily difficult, if not impossible. With its broad conception of causation and capacious view of mitigating constraints on free choice, the SED defense would transform criminal litigation. A large percentage of defendants could plausibly claim that their crimes were mitigated or excused by the deprivation they experienced. Thus on purely pragmatic grounds, lawmakers have been unwilling to open a Pandora's box by adopting a defense that would also undermine the basic principles of criminal responsibility.[211]

The argument for a defense based on severe economic deprivation is far broader than our claim that social context interacts with endogenous features of adolescence in ways that can affect the decision-making of young offenders. The interactive framework we describe focuses on the peculiar vulnerability to environmental stimuli of individuals during a discreet stage of normal development; moreover, the environmental stimuli that impact criminal choices in our framework are limited to those that influence adolescents *because* of endogenous vulnerabilities associated with this stage. Thus the developmental framework is self-limiting. In contrast, the harm of severe economic deprivation, on Delgado's view, may begin in childhood and adolescence, but its impact and relevance to criminal responsibility can extend to any adult criminal who has suffered the effects of deprivation. Moreover, the sources of the harm that can impact individual criminal behavior include many aspects of life in an impoverished community, from deficient parenting to physical

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210. Delgado, *The Wretched of the Earth*, *supra* note 19, at 5.

211. *See* Andrew E. Taslitz, *The Rule of Criminal Law: Why Courts and Legislatures Ignore Richard Delgado's Rotten Social Background*, 2 ALA. C.R. & C. L. L. REV. 79, 121 (2011) ("[The RSB defense violates] basic precepts of mens rea, entity liability, moral culpability, and duty toward others that violate our whole sense of what defines American criminal law."); Mythri A. Jayaraman, *Rotten Social Background Revisited*, 14 CAP. DEF. J. 327, 343 (2002) ("Using Rotten Social Background as an excuse defense is impracticable, because it is nearly impossible to show that, based on his Rotten Social Background, the defendant did not know the nature and quality of his act."). Morse acknowledges this although his objections are based on the incompatibility of SED with principles of criminal responsibility. *Deprivation and Desert*, supra note 20. Morse acknowledges this although his objections are based on the incompatibility of SED with principles of criminal responsibility. *Deprivation and Desert*, *supra* note 20.

conditions (such as substandard housing) to unemployment. Further, Delgado views the inclination to offend as a pathology caused by poverty, not as a response characteristic of a normative developmental stage.[212]

The importance of social context under our framework is specific and limited. Peers and other aspects of the adolescent's social environment stimulate normal biological tendencies toward reward-seeking and impulsivity in ways that undermine the youth's capacity for rational choice and deliberation. These developmental influences do not excuse the youth from criminal responsibility; the interaction does not deprive the youth altogether of the capacity for rational reflection or result in irresistible compulsion. But a normative adolescent capable of making a rational decision under neutral conditions predictably will be inclined to act impulsively and with little consideration of future consequences when associating with risk-inclined peers. Also predictably, most youths will outgrow this tendency to engage in risky activity. As the Supreme Court clarified, adolescent immaturity is relevant to the law's response to juvenile crime for two reasons: first, teenage decision making is impaired due to developmentally-linked influences and, second, most juvenile offenders will mature out of their antisocial inclinations; their welfare, as well as social welfare, will be enhanced if the legal response to their offending offers the opportunity to do so.

To be sure, many adolescents who get involved in criminal activity live under conditions of socio-economic deprivation. But only those aspects of the social context that interact directly with the developing brains of adolescents are relevant to our analysis and only to the extent that these factors contribute directly to normative risk-taking by encouraging reward-seeking and impulsivity. Thus, physical conditions and many environmental influences that likely influence the life trajectories of youth living in poverty are excluded from our analysis, although they may indeed contribute to criminal behavior. This is not to say that lawmakers should ignore the impact of economic deprivation,[213] but only to clarify that the argument for criminal mitigation on this ground is far broader than the one we are making.

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212. *See* Delgado, *supra* note 19, at 24-25.

213. Clearly amelioration of poverty is good social policy on many grounds including the likely contribution to crime reduction.

C. Correctional Policy in an Interactive Framework.

Part III explained that correctional programs constitute social contexts for young offenders and that youths' tinteractions with correctional settings can shape the trajectories of their future lives. Criminal sanctions that fail to offer conditions important for the accomplishment of essential developmental tasks can undermine the adolescent's maturation to productive adulthood. But correctional programs that embrace the developmental lessons that we have described can maximize the likelihood that the juvenile offender will mature out of his inclination to get involved in criminal activity. Correctional settings that incorporate developmental knowledge help the juvenile to make a successful transition to adulthood by assisting him to acquire the skills and tools needed to assume adult work and family roles.

Successful correctional programs and facilities will recognize the importance of social context to healthy adolescent development.[214] Effective correctional interventions aim to provide an antidote to the environmental influences that encouraged antisocial behavior by incorporating the three conditions needed to facilitate social development.[215] As Part III explained, these included an authoritative parent or other adult invested in the youth's welfare to provide support and guidance,[216] association with pro-social peers (and limited exposure to antisocial peers),[217] and meaningful activities to assist the adolescent to acquire skills needed for adult roles and to develop autonomy.[218] We discuss each dimension in turn.

First, policies grounded in the interactive framework aim to foster the relationship between the young offender and one or more authoritative adults. Ideally, this can be accomplished by assisting parents to adequately

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214. *See* SCOTT & STEINBERG, *supra* note 151, at 59.

215. *Id.* at 56-58; NATIONAL RESEARCH COUNCIL, REFORMING JUVENILE JUSTICE: A DEVELOPMENTAL APPROACH 120 (2013).

216. Laurence Steinberg, *We Know Some Things: Adolescent-Parent Relationships in Retrospect and Prospect,* 11(1) J. RES. ON ADOLESCENCE 1, 8 (2001); SCOTT & STEINBERG, *supra* note 151, at 56.

217. B. Bradford Brown & James Larson, *Adolescents' Relationship with Peers, in* HANDBOOK OF ADOLESCENT PSYCHOLOGY (Richard Lerner & Laurence Steinberg, eds., 2004); SCOTT & STEINBERG, *supra* note 151, at 57.

218. SCOTT & STEINBERG, *supra* note 151, at 57.

fulfill their role. The most successful community-based correctional programs aim, as a core goal, to enable parents of young offenders to function more competently.[219] These programs teach parents the importance of engagement, supervision, and guidance as keys to effective parenting of adolescents and seek to provide the tools needed to function as authoritative parents. The importance of involving parents in juvenile correctional programs and teaching them to fulfill their critically important role in their children's lives has led experts to insist that residential correctional facilities be close enough to the juvenile's home that parents can participate in rehabilitation programs.[220] If parents are unable or unwilling to participate meaningfully in a program aimed at developing their competency, or if their child cannot accept them, another caring adult can serve as a substitute, providing guidance and mentorship.[221] This adult may be a correctional professional or therapist, or it may be a teacher, coach, or social worker with whom the juvenile has, or can develop, a close relationship.

Second, a healthy correctional setting limits the influence of antisocial peers and facilitates engagement with pro-social peers. This presents a challenge in residential programs for juvenile offenders since, by definition, the peer group consists of youths who have demonstrated an inclination to engage in antisocial behavior. One implication of the developmental analysis is that residential programs should be small and create a structured environment. The residential delinquency programs thought to be most effective follow some version of what has been called the Missouri model, which is based on small facilities near juvenile offenders' homes (to facilitate parental involvement); the program provides structure and adult supervision and limits casual peer contact. For juveniles in community correctional programs, the antisocial peer group represents a serious temptation to return to involvement in criminal

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219. SCOTT & STEINBERG, *supra* note 151, at 216-218; NATIONAL RESEARCH COUNCIL, *supra* note 215, at 125, 159; Scott W. Henggeler, Gary B. Melton, & Linda A. Smith, *Family Preservation Using Multisystemic Therapy: An Effective Alternative to Incarcerating Serious Juvenile Offenders*, 60 J. CONSULTING & CLINICAL PSYCHOL. 953 (1992).

220. Governor David Patterson's Task Force on Transforming Juvenile Justice, CHARTING A NEW COURSE: A BLUEPRINT FOR TRANSFORMING JUVENILE JUSTICE IN NEW YORK STATE, 49-51 (2009); National Research Council, *supra* note 105, at 428.

221. Facility staff, probation officer, teacher or other relative can fill this role.

activity. Programs that effectively reduce recidivism aim to provide tools that will assist the youth in resisting antisocial peer influence and to facilitate connection with pro-social peers.[222] Because integration (or reintegration) of the juvenile offender into pro-social peer groups is so important, a school district policy that segregates or excludes former offenders is problematic as it will likely isolate these youths from pro-social influences.[223] Community programs that encourage offenders' involvement in sports and other mainstream peer activities potentially can deter association with antisocial peers and promote healthy peer relationships.

Finally, programs can prepare young offenders for adult lives by assisting them to develop social, educational and vocational skills and to learn to make decisions independently and engage in critical thinking. Youths in the community can participate in mainstream educational programs and programs that assist them to prepare for work roles, under the supervision of correctional professionals who can provide support, encourage compliance with requirements, and insist on completion.[224] Providing meaningful programming is more difficult in a residential setting, but some states have adopted educational and skill building programs in residential facilities that aim to prepare juvenile offenders for adult life.

Our analysis of the importance of the correctional setting in achieving the law's goal of minimizing recidivism and facilitating healthy maturation has an important general policy implication. Large institutions historically have dominated juvenile correctional systems in many states; our analysis indicates that these facilities are impoverished social contexts that lack the conditions that promote healthy development.[225] Typically these institutions are in rural settings far from young offenders' (urban) homes, and thus do not readily accommodate involvement of parents in

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222. *See* National Research Council, *supra* note 105, at 414-429; CHARTING A NEW COURSE, *supra* note 220, at 51.

223. National Research Council, *supra* note 105, at 181; Mark W. Lipsey, *The Primary Factors that Characterize Effective Interventions with Juvenile Offenders: A Meta-Analytic Overview*, 4 VICTIMS & OFFENDERS 124 (2009).

224. NATIONAL RESEARCH COUNCIL, *supra* note 215, at 79.

225. Bishop & Frazier, *supra* note 162, at 7-16; Martin Forst, Jeffrey Fagan & T. Scott Vivona, *Youths in Prisons and Training Schools: Perceptions and Consequences of the Treatment-Custody Dichotomy*, 40 JUV. FAM. CT. J. 1 (1989).

programs. Staff in large institutions necessarily act as custodians and guards; the setting does not lend itself to the kind of relationship between authoritative adults and adolescents that meets developmental needs.[226] Beyond this, juvenile institutions house large numbers of offenders and generally lack the capacity to supervise the residents, exacerbating the influence of antisocial peers on one another. Moreover, rival factions that threaten one another are more likely to develop in an impersonal setting in which teenagers do not know all of the other residents. And finally, large institutions seldom provide the customized educational and skill-building programs needed to prepare juveniles for adult life.[227] It is not surprising that as part of the recent reform movement in juvenile justice, many states have closed large institutions and shifted resources to community-based programs.[228] An important report by the National Academy of Science strongly recommends closing juvenile correctional institutions. The report explains that if residential placement is needed for the safety of the community or the juvenile, small facilities near the offenders' homes are likely to provide far better developmental settings.[229]

In general, reformers have favored community-based correctional programs, although few have focused explicitly on how these programs can provide a social context for healthy development more effectively than a residential program.[230] The view that community programs are superior to residential facilities may seem counterintuitive, in that the social context of the juvenile's peers, family, and neighborhood likely contributed to his criminal activity. But a community-based correctional program can assist the juvenile to navigate these social contexts and prepare for adult life in the community by focusing directly on the conditions for healthy development. The premise of Multi-systemic Therapy, among the most successful correctional programs in reducing recidivism in juveniles, is that the therapist engages with the juvenile in all of the youth's social contexts—family, peers, school, and neighborhood.[231] This program

226. SCOTT & STEINBERG, *supra* note 151, at 208.

227. Bishop & Frazier, *supra* note 162, at 256; Kenneth Adams, *Adjusting to Prison Life*, *in* CRIME AND JUSTICE 275-97 (Michael Tonry, ed., 1992).

228. SCOTT & STEINBERG, *supra* note 151, at 220.

229. *See* NATIONAL RESEARCH COUNCIL, *supra* note 215, at 414-29.

230. *Id.* at 42.

231. Henggeler, Melton, & Smith, *supra* note 219, at 953-61; Scott Henggeler et al., *Family*

assists parents to function more capably and provides juveniles with the tools to avoid antisocial peers and to affiliate with pro-social peers.[232] To be sure, community-based programs face the challenge of assisting delinquent youths to avoid the temptation of rejoining their antisocial peer groups. But this temptation will exist when the juvenile is released from residential placement, and community-based programs confront the challenge head-on.

CONCLUSION

Contemporary lawmakers increasingly have recognized the critical importance of adolescent brain development in formulating policies that respond to juvenile crime. Attention has focused primarily on how endogenous biological and psychological factors undermine teenage decision-making and contribute to involvement in criminal activity. This Article broadens the lens to provide a more comprehensive picture, examining the interaction between the immature adolescent brain and the youth's social context. Our interactive framework clarifies that youthful offending, like adolescent risk-taking generally, is a product of a dynamic relationship between the teenager and her environment. Our analysis of the unique salience of social context during this developmental period provides more robust support for arguments for mitigation than claims based narrowly on biological and psychological immaturity. It also provides powerful evidence that correctional programs providing young offenders with healthy developmental contexts are more likely to realize the law's goal of crime reduction than sanctions that ignore the importance of social environment.

Preservation Using Multisystemic Treatment: Long-Term Follow-up to a Clinical Trial with Serious Juvenile Offenders, 2 J. CHILD & FAM. STUD. 283 (1993); Mark Lipsey, *What Do We Learn from 400 Research Studies on the Effectiveness of Treatment with Juvenile Delinquents?*, *in* WHAT WORKS? REDUCING REOFFENDING (James McGuire, ed., 1995).

232. PETER GREENWOOD, CHANGING LIVES: DELINQUENCY PREVENTION AS CRIME-CONTROL POLICY 72 (2006).