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Review Article

Developing an integrated biosocial theory to understand juvenile delinquency: from the social, cognitive, affective, and moral (SCAM) perspectives

Yu Du*

Department of Sociology, Criminology and Law, University of Florida, Gainesville, Florida, USA

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***Correspondence:**
Dr. Yu Du,
E-mail: duyu@ufl.edu

ABSTRACT

Biosocial theory has made considerable progress in explaining juvenile delinquency and making explicit references for juvenile justice policy during the past decades. However, because biosocial theory aims to identify multiple risk factors, it makes juvenile justice practice and develop delinquency prevention programs difficult. This paper proposes an integrated biosocial theory from the social, cognitive, affective, and moral (SCAM) perspectives to understand juvenile delinquency and facilitate the development and improvement of prevention and intervention programs. The article briefly summarizes the background and the key concepts of the chosen criminological theories and the logic of theoretical integration. Then it articulates the four aspects of the integrated biosocial theory and how it can contribute to criminology in details. Lastly, the paper identifies its potential limitations and provides practical implications.

Keywords: Biosocial criminology, Juvenile delinquency, Prevention, Theoretical integration

INTRODUCTION

Criminological theory constantly evolves and seeks to explain criminal and antisocial behaviors. Historically, there are three broad theoretical domains: sociological, psychological, and biological domains. Although different perspectives emphasize a variety of risk factors for criminal behaviors, it is hard and unrealistic to completely separate these three categories, especially when considering juvenile delinquency because adolescence is a critical period for cognitive, affective, social, and moral developments. As neuroscience and technology advance, numerous researchers begin to be more aware of the interconnection between different types of criminological theories, such as strain theory, social learning theory, self-control theory, biological and developmental life-course theory. Even within the emerging domain of biosocial criminology, the perspectives from brain typical and atypical developments, behavioral genetics, self-control, and socio-environmental influences has become more integrated and interactive.[1] Unsurprisingly, integrated criminological theory has been considered as a more comprehensive way to explain the larger portion of delinquency, as well as provide solid foundations to develop innovative solutions for social problems and effective juvenile delinquency prevention programs.

Three of the most influential criminology theories across the three domains are self-control theory, social learning theory, and strain theory. Although all three theories have substantial merits and empirical support, they altogether lack a unified understanding of juvenile delinquency. Aligned with DeLisi and Vaughn's argument, I argue that

an integrated theory needs two basic prerequisites.[2] It should be explanatory, valid, and predictive for delinquent behaviors and be able to explain delinquency independent of contexts or certain life-course phases. Therefore, the integrated biosocial theory should be able to use fundamental concepts to explain the multi-dimensional aspects of juvenile delinquency and its consequences. The integrated biosocial theory argues that, instead of identifying multiple risk factors which makes juvenile practice extremely difficult, researchers should first focus, understand, and tackle some of the most predictable factors that are already established from traditional criminological theories and then move forward one step a time to make real progress.

This integrated biosocial theory, which emphasizes on the social, cognitive, affective, and moral (SCAM) perspectives, acknowledges the multi-dimensionally explanatory factors in juvenile delinquency. The integrated biosocial theory not only emphasized the bidirectional interactions of adolescents' biological developments with social environmental contexts, but also connected with essential and derivative concepts from various traditional theories: (a) social learning theory, (b) self-control theory, (c) micro-level strain theory, and (d) moral development perspective.[3-7] Likewise, its comprehensiveness can be proactively translated into juvenile delinquency prevention programs which deal with multiple outcomes and individual differences in the population level.

Drawing extensively on the criminological theory literature and cognate studies in genetics, brain science, developmental psychology, and neuroscience, the current paper has four components. First, I briefly present the background and the key concepts of the chosen criminological theories. Second, I demonstrate the logic of why I choose certain key concepts or theories to establish the integrated biosocial approach to understanding juvenile delinquency. Thirdly, I articulate the four aspects of the integrated biosocial theory and how it can contribute to criminology in details. Lastly, I would identify the potential limitations on the integrated biosocial theory and its practical implications.

BRIEF BACKGROUND ON THE THEORETICAL CONCEPTS

Self-control from self-control theory

Under the influences of both classical and positivist theories of crime, Gottfredson and Hirschi argued that crime was a joint result from an individual's criminal propensity (positivist theory), and an increasing pursuit of pleasure (classical theory).[5] One's ability to avoid criminal and analogous behaviors is associated with his or her self-control in certain situations.[5] Straightforwardly, crime is a behavioral and emotional manifestation of low self-control.[8] Normatively, people with low self-control are more likely to be impulsive, risk-seeking, insensitive to other's need, and unable to delay gratifications.[8] Although self-control is initially considered as a stable personality trait, several studies have proved that it is malleable and responsive to social interactional influences.[9] Variations in individual levels of self-control can be a result of multiple factors, such as certain genetic deficits, dysfunctional brain development, ineffective childrearing practice, low parenting efficacy, and association with delinquent peers.[3,8-11] Therefore, the significance of self-control in explaining and predicting adolescents' delinquent behaviors is substantial.[12]

Differential association process from social learning theory

Social learning theory argues that conforming and delinquent behaviors are produced by the same learning mechanism. "The difference lies in the direction of the balance of influences on behavior".[4] The four key elements of Akers' social learning theory are differential association, definitions, differential reinforcement, and imitation. Differential association is the most validated element of social learning theory.[12] The intimate and primary social groups that people differentially associate and interact with are their family members and friends. This socialization both directly and indirectly plays a crucial role in providing social context for an individual to learn and practice delinquent behaviors.[13] The impacts of secondary social groups (i.e. church members, school teachers, and authority figures) are also important, especially when an individual grows up from childhood to young adulthood and spends a majority of the time in school.[13] Individuals are repeatedly and gradually exposed to the values and standards of conducts not only from their parents, but also from those of their peers, siblings, and other adults that they interacted with in their lives, as well as mass media, social institutions, and communities. In addition, peers' pro-delinquent attitudes and behaviors have a significant and independent effect on juvenile delinquency because adolescents are more susceptible to peer pressure and eager for social inclusions, thereby considering peer approvals as reinforcements.[14]

Strains from the general strain theory

Strain theory has its history in explaining crimes and juvenile delinquency at both structural and individual levels, originated from Merton (1938), to Cloward and Ohlin (1960), and ultimately to Agnew (1992). Lower-class population's inability of obtaining monetary success or middle-class goals due to limited legal channels generates strain and frustration, thereby leading to criminal behaviors.[15] However, more criminologists today agree that the blockage of monetary success is not the only way to generate strain. Elliott et al have pointed out several other social and nonsocial goals that juveniles normally pursued, such as popularity among peers, autonomy from adults, relationship with parents, school experiences, and reputations or respects from peers.[16]

Not all negative emotional responses lead to equal probabilities of criminal behaviors.[17] Strain, as a subjective experience, is more likely to lead to delinquency and crime when it is associated with (a) unjust, (b) high in magnitude, (c) low social control, and (d) pressure to criminal coping mechanism.[17] In addition, middle adolescence is a significant and vulnerable period for the development of insisting on their own beliefs and resisting to peer pressures.[18] Frustration and strain are more likely to occur when juveniles do not receive the expected rewards or outcomes, undergo verbal and physical assaults, and suffer from discriminations.[7,14,19] Overall, several studies have found that strains may increase the probability of delinquency for several reasons, thereby constituting one of the major explanations of criminal and delinquent behaviors.

RETIONALE OF THEORETICAL INTEGRATION

Obviously, there are multiple approaches for theoretical integration. The integrated biosocial theory specifically articulated criminogenic factors from four perspectives: (a) cognitive, (b) social, (c) affective, and (d) moral. The essential concepts are from self-control theory, social learning theory, and the general strain theory.[4-6] The concepts I chose are not because they have higher predictive and reputable values, but because they share common articulated and unarticulated assumptions (more detailed explanations are in the following sections):

1. All the three theories are on the micro level;

2. All the key concepts (self-control, social learning process, strain/frustration) contain biological components for criminal propensity, such as genetics and the brain;

3. All theories acknowledge that criminality and delinquent behaviors are malleable, socially conditioned, and influenced by biosocial interactions;

4. All key concepts have positive and negative valences, thereby being categorized as either protective or risk factors for juvenile delinquency, namely low vs. high self-control, conventional vs. deviant peer associations, and positive vs. negative coping mechanism for strain;

5. All theories propose that criminal and deviant behaviors are not only outcomes, but rather should be understood by coupling with criminogenic environments, such as differential susceptibilities, opportunities, and perceptions of delinquency;

6. All theories are logically and normatively interrelated for explanations of juvenile delinquency and one's morality, ranging from initially dispositional morality, to moral development and sensitivity, and lastly to the degree of moral disgust resulting from unjust experiences.

The question of why a juvenile became delinquent is more complicated and less predictable in real life for everyone. Therefore, there is a need to articulate an integrated biosocial theory, identifying risk factors from social, cognitive, affective, and moral perspectives. An individual's biological dispositions for delinquency can differentially influence and be influenced by his or her family dynamics, school context, peer networks, and the community. However, none of the risk factors can predict delinquency but increase the delinquent propensities.

THE INTEGRATED BIOSOCIAL THEORY

Juvenile delinquency is a multi-faceted and developmental problem by its nature. Instead of analyzing a life-course developmental process in group level, the integrated biosocial theory focuses on four basic aspects for each adolescent: peer socialization and learning process (S), cognitive deficits and executive dysfunctions (C), frustration and strain from both daily and long-term stress (A), and development of morality and moral response (M). All the four aspects are interrelated and bidirectionally interact with each other.

Cognitive perspective

Self or cognitive control is one of the strongest predictors for juvenile delinquency. Previous research has largely focused on the social, economic, and environmental risk factors in explaining adolescent low self-control. However, in the theme of The Era of the Brain, researchers argues that low self-control is more likely to be genetic rather than social, resulting from parents' prenatal smoking, alcohol consumptions, malnutrition, stress, poverty, birth complications, and any disadvantaged conditions which can increase the probability of inducing abnormal brain developments and dysfunctions of neural connections.[11,20] Neuroscience research also supports that certain neuropsychological deficits, such as ADHD, low birth weight, and fetal alcohol syndrome , can explain the individual differences in low self-control.[10] Specifically, adolescent's low self-control is associated with the underdeveloped prefrontal cortex (PFC), relatively more mature ventral medial PFC and limbic system for rewarding system, small volume of amygdala, and certain neurotransmitters (i.e., dopamine and serotonin).[18]

Furthermore, beyond identifying a single brain region, recent research well accepts the cold/hot dual cognitive mechanisms and functional connectivity for self-control.[21] The cold/hot cognitive processes refer to the discrepancy between cognitive interpretations and affective reactions of criminogenic circumstances.[22] The neural pathway for the dual mechanism strongly emphasizes the interdependent relationship and differential process between cognition and emotion in criminal decision-making and behaviors. More importantly, an adolescent's brain allows for an independent activation of affective neuro-circuits without

an involvement of cognitive control, thereby leading to their immature and delinquent behaviors because of low self-control and inability to delay gratification.[3,22]

Obviously, biological (i.e., gene and brain development) and social factors (i.e., family relationships, normative expectations, peer influence, social norms, direct and vicarious experiences), are inseparable in predicting and explaining youth's cognitive control and executive functions, as well as their relationship with delinquency.[21] Especially, when genetic and brain deficits interact with adverse childhood experience, negative family dynamics, and disadvantaged community context, the risk of a child showing genetic defects, brain anomalies, and underdeveloped cognitive functions evidently increases, consequently leading to a higher probability of having low self-control and becoming delinquent. Altogether, cognitive control should be considered as a frontline in explaining and preventing juvenile delinquency.

Social perspective

Adolescents not only value peer socializations, opinions from peers, and peer approval, but also are more susceptible to peer pressures and sensitive to social risk-taking information. Normatively, adolescents spend significant time with their friends, learn or mimic their behaviors, and particularly consider peer approval and social inclusion as rewarding. Linking to the cognitive aspect, several empirical studies also show that youth's low self-control significantly influences peer selection and friendship association.[14] Delinquent peer associations can aggravate the effect of youth's low self-control on delinquency. Adolescents with lower self-control and more delinquent peer associations are at the highest risk of delinquency.

However, an adolescent's choice for friendship or peer network is not free from genetic and biological factors.[23] In short, one's genes probably have a predictive impact on one's choice of friends. Juveniles with risky genes are more vulnerable to the negative parenting practices and delinquent peer networks.[23] Specifically, the peer influences on delinquency are greater for adolescents with (dopamine active transporter 1) DAT1 genes.[24] To some extent, adolescents with similar genotypes may not actively select their friendships, but instead their friendship networks are formed and influenced by institutional or broader social structures.[24] Because the gene-school correlating (rGE) mechanism antecedes adolescents' educational career and peer associations, social risk factors for delinquency, especially peer associations, may be exaggerated for adolescents with biological risk factors.[24]

Moreover, delinquent behaviors and attitudes from peers significantly impact adolescents' delinquent behaviors through direct and vicarious learning processes.[25] And youth's continuous involvements and increasing incidences of delinquency are strongly influenced by external and social reinforcements from peers.[26] Neuroscience research has identified several brain regions for social learning from direct experiences and interpretation of other's intentions, including temporal-parietal junction (TPJ), anterior cingulate gyrus (ACC), dorsomedial prefrontal cortex (dmPFC), and dorsolateral prefrontal cortex (dlPFC).[27] Basically, these brain areas are associated with rewarding, reinforcement, predicted rewarding accuracy and errors, and social learning mechanism from self-reinforced and other-reinforced stimuli.[27] Due to the immaturity and underdevelopment, adolescents tend to have an increased activation of ventral striatum for rewarding system and a deactivation of amygdala for fear conditioning in response to peer associations, which increase their probability of engaging delinquent activities. Obviously, multiple neural circuits and biosocial interactions are account for youth's delinquent learning process and delinquent peer socialization. Peer associations and peer social networks can either reinforce an adolescent's predominant tendency for delinquency due to self-selection process or lead to delinquent behaviors by providing the social contexts, learning opportunities, and rewards, or a combination of both.

Affective perspective

As individuals grow up from childhood to adolescence to early adulthood, their experiences accumulate, and lives become more complex. The affective responses to life events and emotional regulations to undesirable outcomes can become an important aspect in explaining adolescents' delinquent behaviors. Elliott et al have pointed out several social and nonsocial goals that juveniles normally pursue, such as popularity among peers, autonomy from adults, insistence of own beliefs, relationship with parents, school experiences, and reputations or respects from peers.[16] Frustration and strain are more likely to occur not only when juveniles are unable to achieve any of these goals or experience of adverse events, but also when they do not receive expected rewards, or predicted outcomes, or suffer from verbal and physical assaults, or any forms of discriminations.[16,19] Such negative emotionality, ineffective emotional regulation and coping mechanism, and inappropriate affective responses ultimately tend to result in reactive and proactive aggression and violence.[19]

Both biological and psycho-social factors can influence and shape an adolescent's affective responses to certain situations, daily events, and social interactions with others.[3] PFC, amygdala, periaqueductal gray (PAG), limbic system, ACC-insula-amygdala-PAG connectivity (the "rage" brain network), and vmPFC-amygdala circuit have all been found to have significant implications for anger, frustration, strain, and aggression.[28] For instance, prefrontal cortex is activated for the regulation and responses of stressful and frustrating situations.[28] Dysfunctional PFC activity has been linked with increased feelings of anger and aggressive behaviors.[19]

Tassy et al specifically identify that dlPFC is associated with emotional decision-making process because adolescence is characterized by heightened emotional reactivity, immaturity, instability and risk-taking, and hypersensitivity to peer rejections, the average emotional states are more negative and unstable across early adolescence.[29] This can potentially explain why adolescents are more likely to feel the strain and frustration, which, in turn, increase their probability of engaging aggressive, violent, and delinquent behaviors.[28]

Likewise, it is not surprising that cognitive and executive functions play a crucial role in emotion regulation. Better executive functions are associated with greater ability to down-and up-regulate emotions.[30] However, adolescents typically show exaggerated amygdala and ventral striatum activities, providing evidence that when required to regulate behavior, adolescents may be driven disproportionately by subcortical activations. Additionally, negative emotions tend to disrupt youth's regulatory efforts and inhibitory control more easily. As frustration and strain become salient and increase, demands for emotion regulation increase.[30] An effective connectivity between PFC and limbic system is needed. However, this connectivity is still developing and not effective enough during adolescence.18 Since ineffective prefrontal-limbic control is important in the etiology of aggression, adolescents' poor affective regulation and low frustration tolerance can lead to their increased delinquent behaviors.

Moral perspective

Morality can be both genetically dispositional and developmentally changeable through social interactions and learning process. Researchers have found a "moral brain" network consisting of vmPFC, orbitofrontal cortex (OFC), dlPFC, ACC, TPJ, and amygdala.[31] For example, Ventral medial PFC is involved in moral decision-making processes and OFC is activated for moral reward. Dysfunctions and under-developments in any of these brain regions are associated with an adolescent's low dispositional morality, which is a normative manifestation for self-control.[31] Like self-control, adolescents with low dispositional morality are more likely to engage in delinquent activities.[32] The delinquent behaviors are not only because adolescents tend to have lower self-control, but also because they cognitively and emotionally prioritize their own well-beings and gratifications instead of others.[32] Particularly, dispositional morality is more likely to associate with profit-orienting crimes, such as shoplifting and stealing.[32] Furthermore, dispositional morality also interacts with situational factors.[33] Adolescents with low dispositional morality show more delinquent behaviors when the situation is induced as deviance-encouraging, revealing that they are more likely to be affected by the surrounding environments.[33] The impact of dispositional morality on juvenile delinquency is as strong as the impact of self-control.[33] A development of a moral self is referred as how individuals adopt and learn rules of right or wrong and good or bad and as one's capacity to interpret a situation from the moral aspect or to understand the ethical dilemma, including how one's own behavior will affect others.[34] Due to the developmental nature of adolescents, their brains and behaviors are malleable and responsive to social environments.[9] Moral development and sensitivity are a social learning product from an individual's family, school, neighborhood, and the entire societal world.[34] For example, adolescents under long-term exposure to conflicts within families are more likely to develop distorted moral values and become morally insensitive.[26] Whereas, high academic achievements and positive school experiences can facilitate an adolescent's morality learning process and buffer the biological dispositions for delinquency.[25] However, children who learn different standards from family and peers tend to adopt different sets of moral standards to guild and restrict personal conducts, as well as to predict their behavioral consequences.[34] Adolescents who do not systematically learn, form, and internalize the moral standards are more tolerant and susceptible to external risk factors for deviance.[34] Stevens et al have revealed that a youth's initial onset of delinquency is linked with moral insensitivity and internal pleasure received from risky behaviors.[26] An adolescent's continuity of delinquency can both be impacted by and impact his or her own moral development.

Moreover, one's dispositional morality and moral development can subsequently influence different degrees of moral disgust. In addition to frustration, moral disgust is another evaluative emotional response associated with strains, which can influence people's moral judgments, evaluations, and responses to moral and legal transgressions.[19] A social intuitionist model has identified specific associations between moral disgust and delinquent behaviors by arguing that youth with lower moral disgust are more likely to engage in delinquency and less likely to obey moral and societal rules.[35] Moral disgust can be dispositional and/or be developed either situationally or through learning process. It facilitates conflicting avoidance and behavioral withdrawal, thereby serving as a protective factor for juvenile delinquency.[36]

PRACTICAL IMPLICATIONS

The more risk factors of juvenile delinquency that researchers have discovered from multiple perspectives, the more tough questions occur concerning juvenile competency, culpability, punishment, delinquency prevention, and intervention programs. Future scientific research, neuro-ethical challenges, and legal implications associated with the integrated biosocial theory will also emerge accordingly. However, the integrated biosocial theory certainly provides some practical recommendations and points to the need for innovative approaches to delinquency prevention and intervention programs that identify specific components of this theory. Firstly, the theory suggests that delinquency prevention

programs could potentially benefit more for juveniles both with risky genes and lack of protective genes by improving cognitive, social, and affective factors. There are two fundamental approaches to develop prevention programs based on the integrated biosocial theory: (a) prevent the initial presence of biological risk factors, such as developments of risk genes, abnormal brain structures, and cognitive deficits), and (b) prevent subsequent juvenile delinquency among individuals with identified biological and social environmental risk factors as early as possible.

Delinquency prevention programs should target on the neediest populations, such as the low-income unmarried female-headed families with the lowest psychological resources, rather than a universal basis, to reduce the impacts of genetic defects, brain dysfunctions and maldevelopments on the delinquent propensity. In addition, prevention programs focusing on the improvements of cognitive skills and developments are more effective in reducing delinquency.[37] Many cognitive-training activities, such as martial arts, yoga, meditation, and school curriculum, has been revealed to successfully improve children's executive functions.[38] Children with genetic risk factors and worse executive functions benefit the most from these cognitive focused activities.[39] Moreover, several prevention programs reveal that improving children's negative emotionality and emotional regulations significantly reduce externalizing behaviors and conduct problems.[2] Lastly, from the moral perspective, people's moral strengths are also malleable and influential. Experiencing moral emotions after moral transgressions can be preventive for juvenile delinquency.[39] Although moral developments and improvements are complex, delinquency prevention programs providing moral education and managements after schools can be promising and effective.[39]

However, for adolescents to change their risk behaviors proactively and self-directed, they need to be provided not only with the cognitive reasons and affective capacities to alter high-risk behaviors and mindsets, but also with the means, resources, and social supports to achieve so. Violence prevention programs, including skill-building curriculum, temperament managements, goal settings, conflict resolutions, and violence avoidance, tend to show greatest effects when they are incorporated with contextual and community-level changes in many risk factors for juvenile delinquency. With appropriate ethical considerations and restrictions, beforehand screening for neurological and brain deficits can be effective and beneficial to determine the type, frequency, and intensity of the prevention programs and rehabilitative treatments.[37]

Practically, the integrated SCAM biosocial theory proposes a proactive and preventative approach to curtail juvenile delinquency. This approach is more compelling, cost-effective, and beneficial for a larger population's health because it resonates with the WHO's hierarchy of preventions and the public health's prevention effectiveness hierarchy. Prevention programs targeting a broad population and incorporating biological and ecological risk factors are more likely to consistently produce larger net benefits than more intensive interventions and specific policies targeting fewer adolescents at highest risks. Furthermore, delinquency prevention programs can reduce social stigma and discrimination both implicitly and explicitly, thus systematically decreasing negative labeling effects and ripple effects of getting involved with juvenile justice system. Since any involvements in the juvenile justice system can have collateral consequences and are potentially detrimental for an individual's quality of life, the best way is to avoid entering the justice system at the first place.

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