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Comment Kenneth A. Dodge**Processes in the Prevention of Crime and Delinquency**

Hill, Roberts, Grogger, Guryan, and Sixkiller (chapter 8, this volume) are to be congratulated for their review of interventions to decrease delinquency, criminal behavior, and recidivism, particularly for their insight in bringing a focus to this review on psychological processes that might mediate the impact of intervention on long-term outcomes. This commentary will highlight the contribution made by Hill and colleagues, provide a different conceptualization of psychological processes in delinquency, and then propose a broader model of possible intervention targets in delinquency prevention.

Why Focus on Psychological Processes?

Traditional perspectives on the prevention of criminal behavior within economics have treated the individual as a “black box” without concern for how a program might achieve success, beyond presumed-but-untested influence on an individual’s appraisal of the costs and benefits of a decision to engage in crime. However, an understanding of the psychological mechanisms through which a program operates successfully is crucial to future program planning, implementation, and public policy, for two reasons. First, it is unlikely that programs that have been evaluated through small-scale randomized controlled trials will ever be disseminated at scale in precisely the same manner in which they had been implemented originally. The original program might have been implemented decades ago in a different policy era, with children of a limited range in ethnicity, with interventionists who are graduate students or university employees who are supervised by program developers, or with participants who are volunteers who have consented to be studied.

Planned adaptations as well as unanticipated problems in scaling up will bring a different “look” to disseminated programs. Adaptations are often planned when a program is implemented with a different age, gender, or cultural group than the one for which it had been created. These changes are viewed as “improvements,” albeit without careful evaluation. Problems in scaling up a program may lead to degradation in training of interventionists, supervision, caseload, adherence to fidelity, and infrastructure support. Welsh et al. (2010) have reviewed studies of scaling up early intervention programs for families with young children at risk for delinquency and have concluded that scaling-up degrades impact by 15 to 40 percent, called the

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“scale-up penalty.” The net result of these planned and unplanned changes is that scaled-up and disseminated programs rarely mimic the original program precisely.

Whether the sum of planned and unplanned changes improves or degrades the long-term impact of a disseminated program on preventing delinquency and crime will not be evident to program officials immediately, but they cannot wait for these long-term outcomes to determine a program’s merit. They need an early signal of program effectiveness. Thus, the second reason for focusing on proximal psychological processes is to evaluate whether a program is changing a targeted child in the desired direction. A contribution of the Hill et al. review is to begin to identify these optimal proximal targets by reviewing the impact of programs on cognitive abilities and personality.

The importance of identifying optimal proximal targets can be understood through an analogy to interventions in a very different domain, cardiovascular disease prevention. Some of these interventions aim to have a long-term impact on myocardial infarctions by addressing exercise, diet, stress, and lifestyle. But which exercise programs, which diets, and which lifestyle changes are effective, and which components of these programs must be preserved in dissemination? Few of these interventions have been evaluated for long-enough time periods to know whether they lower the risk of heart attacks. However, basic epidemiological research has identified an important process and early predictor of cardiovascular disease in the measure of blood pressure. New behavioral health programs and pharmacologic interventions that aim to prevent heart attacks are evaluated based on their proficiency in lowering blood pressure in individuals, at least until long-term follow-up can be completed to determine efficacy in preventing heart attacks. Furthermore, blood pressure has become the proximal target of pharmacologic interventions to prevent heart disease. These interventions are rarely disseminated with a static dose for all patients; instead, the physician titrates the dose until an optimal blood pressure level is achieved. If an intervention lowers blood pressure, it is assumed also to lower the risk of cardiovascular disease.

Similarly, evaluation of new delinquency prevention programs and policies cannot wait until their participants age out to determine their worthiness. They will be evaluated with regard to their efficacy in having an impact on important proximal processes in development. Likewise, programs that have been found to be effective in long-term delinquency prevention through small-scale trials are unlikely to be scaled up precisely as planned. In scaling up programs, instead of trying to mimic program features that might or might not be crucial to long-term delinquency prevention, it is important to maintain focus on optimal proximal targets. Hence, Hill et al. push the field forward by focusing discourse on identifying processes in the development of serious delinquency and optimal proximal targets for interventions.

They fall short, however, in their conceptualization and labeling of crucial proximal processes.

Cognitive and Noncognitive Targets of Intervention

Hill et al. organize the world of preventive intervention in delinquency into cognitive and noncognitive factors and short-term (less than six months) and long-term programs. The latter distinction seems arbitrary and not likely to catch on as an organizing framework because many short-term programs sometimes last more than six months in reality and some have “booster” interventions in subsequent years.

It is understandable how Hill and colleagues come to the cognitive-noncognitive distinction: the original Head Start program sought to yield long-term impact by changing young children’s intelligence. They also argue that the legal basis for differentiating juvenile and adult adjudication is predicated on an assumption that the primary difference between children and adults is intelligence. Further, they note that Heckman (Cunha and Heckman 2008; Heckman 2008) has divided the world this way. He has examined the superiority of noncognitive abilities over cognitive abilities in predicting labor market outcomes (Heckman, Stixrud, and Urzua 2006) and has been taking aim at cognitive factors in his reanalyses of the data from the Perry Preschool Project (Heckman et al. 2010). Finally, Hill et al. claim, without citation of a single study, that “most efforts to decrease delinquency focus on addressing its cognitive ability catalysts.” They define cognitive ability here as the intelligence quotient (IQ), and they suggest that interventions that address intelligence dominate the field but have not been successful. They argue that the focus should be on “psychological factors other than cognitive ability.”

It seems that they have set up a straw man here in claiming that intelligence has been the target of most interventions and that this target should shift. Psychologists have long ago stopped trying to change intelligence in a traditional way, which has come to be viewed either as irrelevant or more commonly as a genetically endowed characteristic that is shaped by the environment to affect skills, abilities, performances, and achievements. There is a sharp distinction between the intelligence quotient and the large array of mental abilities and skills that are involved in behavioral decision making, and the focus of psychological research has been on identifying the key processes and skills in behavior.

Contemporary interventions and policies are directed toward this array without targeting intelligence per se. The US Supreme Court (*Roper v. Simmons*, 543 US 551, 2005, and *Graham v. Florida*, 560, US, 2010) has ruled twice that legal sanctions (first, death penalty, and, second, life in prison without parole) must differ for juveniles and adults, not because the two groups differ in the intelligence quotient but because of scientific findings that adolescent brain development is not yet complete. In early adolescence,

the brain undergoes rapid changes in myelination, growth, and pruning that alter the individual's ability to understand social events and make decisions about one's behavior. Full self-control, termed executive function, is not achieved until well into adulthood. It seems contradictory to term these processes "noncognitive" when they obviously involve brain activity and mental processes. The scientific field is just now sorting out the array of psychological processes that constitute executive function. Preventive interventions for children are targeted toward these psychological processes, but the field seeks a coherent taxonomy.

Targeting Personality

Hill et al. suggest that the target of interventions should be personality change; specifically, cognitive abilities (not intelligence), personality traits, motivations, and narratives. They note that "Most of the risk factors (for delinquency) appear to be relatively stable personality factors that are akin to cognitive ability," and they cite the work of Miller, Lynam, and Leukefield (2003), which showed that self-report measures of the Five Factor Model of personality (known as the Big Five), particularly Conscientiousness and Agreeableness, are strong predictors of later self-reported anti-social behavior.

Although Hill et al. are to be commended for seeking psychological constructs that might mediate behavior change, the Big Five model that they target is not an optimal choice for a guiding framework. This model is not consistent with the premise of intervention; namely, that personality constructs are amenable to change by exogenous intervention. In personality theory, the Big Five factors are typically theorized as genetically endowed, static characteristics that cause behavior (McCrae and Costa 1997). It is hypothesized that lack of agreeableness "causes" one to behave with crime and delinquency. No explanation is offered about the origins of agreeableness, other than genetic endowments. Agreeableness does not change or develop, just as intelligence does not change. The notion that agreeableness might be altered by environmental experiences or intervention is foreign to the theory itself. In actuality, because of the way that the Big Five constructs are measured, they might well change over time; however, the personality theory guiding this work posits the notion of genetic traits that do not develop or change.

This conception of personality becomes tautological when the measure of agreeableness includes items that are lexically very close to the antisocial behavior that it supposedly causes and predicts. It is no surprise, then, that the measure predicts itself; that is, agreeableness predicts agreeable behavior. It means little, though, that agreeableness might "cause" agreeable behavior. Distressingly, the theory offers little in the way of a process explanation for behavior, little insight into how behaviors develop, and even less in the way of guidance for the design of an intervention program. More dynamic per-

sonality concepts that are consistent with the premises of intervention are skills, competencies, schemas, scripts, and styles of acting on the world.

A Process Model of Personality

A process approach to personality starts with the online mental operations that occur during a social interaction that eventuate in an antisocial act such as assault, vandalism, or burglary. Certain operations, such as perceiving threat from others or judging that the benefits of engaging in a crime outweigh the costs, are associated with antisocial behaviors. Further, it is hypothesized that habitual patterns in these operations are acquired through experience and come to act as personality characteristics that guide future behavior. This constructivist approach to personality has origins in the work of Mischel (1999), follows from the information-processing model of competence by Nobel Laureate Simon (1957), and is carried today by models of social cognition (Cervone and Shoda 1999) and information processing (Dodge 2003; Huesmann 1988).

In response to a challenging social stimulus, such as being teased, “dissed,” or provoked, or in response to an opportunity for personal gain, such as observing an unguarded cash register or unoccupied home, an individual responds in a time-sequential series of mental operations that lead to a behavioral response. The first step is to encode the cues in working memory. Individual differences in encoding patterns, such as hypervigilance to hostile cues or inattention to external controls, may increase the likelihood of antisocial behavior. The second step is to interpret the encoded cues and give them meaning. A person who regularly attributes hostile intent to another becomes likely to engage in retaliatory aggression.

The third step is the experience and regulation of emotion that leads to goal-setting. Emotions motivate action, just as goals do. Regulating anger is crucial to prevention of aggression. Self-defensive goals are relatively likely to lead to retaliatory assault, and self-centered instrumental goals lead to violations of others’ property. Relationship goals lead to restraint. The next step is to access from memory one or more possible behavioral responses to the interpreted social cue. A person who has ready access to numerous antisocial responses and little access to nonaggressive competent responses may be likely to engage in antisocial behavior. Merely generating antisocial responses from memory does not inevitably lead to behaving aggressively, however, and so the next step is a response evaluation step that is as familiar to economists as behavioral decision making. The consequences of behaving in a particular way are contemplated, particularly the evaluation of the positive and negative outcomes of a behavior and the valuation of those consequences in costs and benefits. Some problems of criminal behavior occur because the individual fails to engage in response evaluation altogether and simply acts impulsively. Other problems occur when an individual disengages morally from consideration of others’ consequences (Bandura 1999).

Habitual styles of decision making, such as overvaluing immediate outcomes and undervaluing deferred outcomes, are likely to be associated with criminal behaviors. Finally, a behavioral decision is made and enacted.

Several theoretical assertions of this approach make it differ from a static trait approach. First, specific mental operations (such as hypervigilance to hostile cues, making a hostile attribution about another's intent, adopting a self-defensive goal, and evaluating the consequences of aggressing favorably) are hypothesized as the brain actions that lead to antisocial behaviors, whereas a trait approach does not articulate how the trait causes the behavior. Second, these mental operations are hypothesized as becoming habitual; that is, consistent across time within a person. They may be thought of as acquired personality characteristics because they explain how individuals differ in behavioral propensities. Some of these characteristics are skills, such as accurately interpreting others' intentions, being able to generate many solutions to challenging interpersonal problems, and patiently and accurately anticipating the outcomes of one's actions before responding. Some of these characteristics are biases or patterns in responding, such as a habitual pattern of overinterpreting hostile intent in others and a bias to anticipate that others will evaluate one negatively. Third, these habitual patterns are hypothesized as being acquired through experience. They are learned mental operations. The impact of parent, peer, and cultural influence on a person's development occurs through these mental operations. In fact, it is asserted that those exogenous influences exert their effect on behavior by influencing habitual styles of processing social information. Finally, because these patterns are learned, they might be changed through intervention.

This approach to personality has been embraced by diverse streams of research, and these mental operations are known variously as social-cognitive skills (Dodge et al. 1986), social cognitions (Cantor and Kihlstrom 1982), executive functions, heuristics (Kahneman and Tversky 1982), self-regulation, stereotypes, and internal working models of how the world operates (Bretherton 1999). A large body of empirical research supports the assertions of this model (see reviews by Orobio de Castro et al. 2002; Dodge, Coie, and Lynam 2006; Huesmann 1988).

An Ecological Model of Factors in the Development of Antisocial Behavior

Unlike the trait approach to personality, the processing model of personality posits that family, school and peer, and cultural factors influence the development of processing patterns that mediate behavior (see figure 8C.1). The trait approach asserts the sole role of genetic factors in traits, whereas the processing approach asserts environmental effects, genetic effects, and gene-environment interaction effects (e.g., Caspi et al. 2002).

The processing model also asserts that life experiences influence antisocial behavior through their impact on the acquisition of social-cognitive skills and processing patterns. For example, early mother-infant attachment security has a distal effect on later behavioral development by influencing

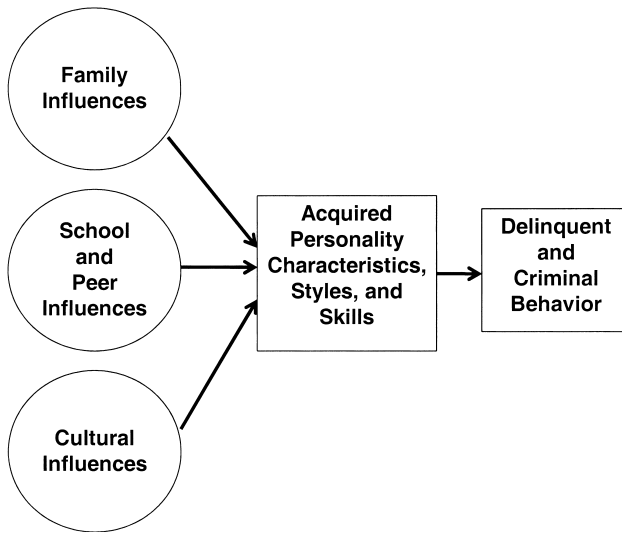


Fig. 8C.1 A schematic model of influences (and potential intervention loci) on anti-social behavior

the internal working models that a child develops about whether the world is a safe or threatening place (Bowlby 1980). Internal working models provide the basis for hostile versus benign attributions during social exchanges. Parents' management of a young child's misbehavior through rewards and punishments influence the child's acquisition of contingent probabilities about the consequences of aggressing and misbehaving (Dodge and Pettit 2003). Teachers influence a child's development of delinquent behavior by teaching the child about the consequences of acting in particular ways, exposing the child to alternate behavioral response options, and teaching the child to solve social problems and resolve conflicts systematically. Classroom peers influence a child's behavioral development by modeling values, teaching a child contingencies about consequences, and exposing a child to new behaviors that become part of a child's repertoire of response alternatives (Dodge and Pettit 2003). Culture broadly influences a child's goals and valuation of outcomes. A thorough literature review of these influences is not necessary to assert that opportunities for intervention abound by considering the various environmental influences on social-cognitive development across the life course.

Reinterpreting a Review of Interventions to Decrease Delinquency

The model described here provides a framework for reorganizing the Hill et al. review of interventions to prevent delinquency and crime. Some interventions target mental operations directly, such as social-cognitive skills training programs and cognitive behavior therapy. Other interventions target the

environmental factors that presumably have an indirect effect on delinquent behavior by influencing social cognitions and mental operations.

This organizational scheme can be applied to the myriad interventions that are reviewed by Hill et al. They review interventions that they classify as school-based, social skills, family system, and nutrition.

School-based interventions are given high marks by Hill et al., who conclude that school-based “conflict resolution programs are generally quite effective in reducing antisocial behavior among youth.” They also applaud after-school programs (and they conclude that academically-oriented programs are less effective than programs that emphasize social skills and character development) and peer relations enhancement programs. It would enhance the contribution of their review to classify these interventions as either directly targeting skills training or targeting teachers or peers as socializing agents. Those interventions that target teachers and classroom policies fit here, whereas those interventions that directly target social cognitive skills probably belong in the next section. The most well-known classroom-based approach is not mentioned, the Good Behavior Game (GBG), which alters disruptive behavior by manipulating group-level contingencies. Randomized controlled trials in first-grade classrooms have yielded positive effects on both proximal (Ialongo et al. 1999) and distal (Ialongo et al. 2001) time points.

Social skills interventions overlap with school-based interventions because many of these programs are delivered in school settings. These interventions fall squarely in the proximal mediator of acquired personality characteristics in figure 8C.1. Hill et al. conclude that some of these interventions are effective, but they are less enthusiastic about this type of intervention. In fact, they conclude that it is the intervention “most in need of future work” among all interventions reviewed, and they make reference to “the lack of efficacy for social cognitive interventions” even though meta-analyses by Landenberger and Lipsey (2005) indicate that interventions that address social-cognitive factors through cognitive-behavioral means are the most effective of all programs reviewed.

Hill et al.’s concept of social skills intervention is very narrow, as evident in their statement that social skills training “is intended to help those individuals lacking in even the most basic interaction abilities, such as making small talk and maintaining eye contact.” Their distinction between social skills and social-cognitive skills interventions seems baseless. A broader concept would incorporate both types and would include interventions that target the array of mental operations just described as patterns of social information processing. As a consequence, the Hill et al. review of this category of interventions is cursory and fails to include many interventions that have been tested through randomized controlled trials and found to be efficacious in improving targeted skills and in preventing longer-term delinquency and crime.

For example, Greenberg and Kusche (1993) have developed an elementary classroom curriculum designed to teach the social cognitive skills described above, including accurate recognition of emotions in others and the self, accurate interpretation of others' intentions, and social problem solving. Their PATHS Program (Providing Alternative Thinking Strategies) has been found in randomized controlled trials to be effective in reducing aggressive behavior and promoting prosocial behavior (Conduct Problems Prevention Research Group 1999).

Hudley and Graham (1993) developed an intervention targeted toward reducing hostile attributional biases in African American children, with demonstrated success in reducing aggressive behavior through a randomized trial. Lochman's Coping Power Program, which is designed to enhance an array of social-cognitive skills in aggressive fourth- and fifth-grade boys, has yielded positive effects on reducing aggressive behaviors that persist a year later (Lochman and Wells 2004). Ross and Ross (1998) found that a cognitive program aimed at helping youth to stop and think about social problems, consider alternative strategies, and consider consequences of their actions had positive effects on reducing reoffending in a delinquent sample. Kazdin (2003) developed a variant of this approach called Problem-Solving Skills Training (PSST). He has found success in reducing aggressive behavior in both home and school settings, that is sustained for at least twelve months, in five replicated randomized controlled trials. Landerberg and Lipsey's (2005) meta-analysis of the array of cognitive-behavior programs for offenders reveals a positive mean effect size from randomized trials, with the strongest positive effects for interventions that address anger control and social problem-solving skills.

One comprehensive social skills intervention program that is reviewed favorably by Hill and colleagues is Botvin's Life Skills Training. However, Hill et al. do not classify this program as addressing social skills, even though it addresses the components of social information processing described earlier; specifically, self-management skills, goal-setting, problem-solving, and evaluation of consequences. Furthermore, Botvin and Griffin (2004) have found that the impact of this intervention on antisocial behavior outcomes is mediated by its effect on social-cognitive patterns such as decision making and perceptions of norms and consequences.

Family interventions consistently yield positive impact according to Hill et al. The basis for many of these interventions is Patterson, Reid, and Dishion's (1992) coercion theory. For example, the primary goal of Parent Management Training (PMT) is to alter the pattern of exchanges between parent and child during discipline events so that coercive behavior by each party is extinguished in favor of contingent, consistent, and clear rules that lead to compliance. The meta-analysis of forty studies by Farrington and Welsh (2003) yielded a mean effect size of .32 in preventing delinquency outcomes. Hill et al. appropriately emphasize three of the most thoroughly-

studied programs: Functional Family Therapy, Multisystemic Therapy, and Multidimensional Treatment Foster Care. All of these programs help the parent to teach the child to understand contingencies for misbehavior and to solve problems more effectively.

Nutrition interventions reviewed by Hill et al. come out of the blue. The only intervention reviewed in this section is one that provides children with essential fatty acids found in fish oil. Here, Hill et al. abandon their reliance on rigorous randomized controlled trials to herald the promise of this intervention. Although the theory behind this intervention is that fish oil affects serotonergic functioning related to impulsive cognitions, the evidence is simply not conclusive yet because of the lack of randomized controlled trials. Most of the evidence is anecdotal or case study. Furthermore, their assertion that nutrition-based interventions require “little or no labor” completely ignores the major challenge in this intervention of getting high-risk, antisocial participants to comply with a treatment protocol in perpetuity.

Cultural interventions are not labeled as such by Hill et al., but they do review the Olweus Bullying Program (Olweus 1995), which is an attempt to change school, peer, and community cultural norms about aggressing and bullying. This program has been implemented widely in Scandinavia, with apparent positive effects. However, this conclusion is based on weak evidence of pre- to post-changes and dose-to-outcome correlations, but no randomized controlled trials.

Conclusion

The review by Hill and colleagues provides a contribution by focusing scholars' attention on the mediating processes that account for intervention effectiveness. However, they may be pointing researchers in the wrong direction with their terminology. They conclude, “nonsocial interventions can have as strong, if not stronger, effects than programs targeting IQ or the environment.” Ironically, the interventions that they find to be most effective *do* target both cognitions and the environment. To call these interventions nonsocial is to create a false dichotomy. After all, all social behavior is brain-mediated. Certainly, the day of targeting IQ is long past, but effective interventions are those that target important mental operations in aggressive behavior, either through direct skill-building or indirectly through changing family, school and peer, and cultural environments that in turn affect a child's mental patterns of operating on the world.

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