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# Decreasing Delinquency, Criminal Behavior, and Recidivism by Intervening on Psychological Factors Other Than Cognitive Ability

## A Review of the Intervention Literature

Patrick L. Hill, Brent W. Roberts, Jeffrey T. Grogger,  
Jonathan Guryan, and Karen Sixkiller

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### 8.1 Introduction

Research on the causes of crime and delinquency has a long history, with philosophical and theoretical commentary on the topic dating back centuries (see for a review, Binder 1987; Emler and Reicher 1995). This work often has been directly or indirectly catalyzed by efforts to define laws and penalties appropriate to juvenile offenders. If one deems a youth to be a cognitively mature decision maker, then the youth might be more “deserving” of penalties similar to adult offenders. If one instead is sympathetic to the turmoil and tumult inherent in the adolescent experience (see, e.g., Blos 1962; Erikson 1950, 1968), more lenient penalties may be in order. Given the legal implications, it is unsurprising that most efforts to decrease delinquency focus on addressing its cognitive ability catalysts. Another benefit to a cognitive ability approach is that it seems to explain the decrease in illegal activity with age. Adults are assumed to have better cognitive capabilities than adolescents, and thus are able to make better decisions.

Three issues confront researchers who focus solely on cognitive ability antecedents to delinquency and criminality. First, focusing on cognitive ability assumes that adults make more conservative judgments about the

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consequences of their risky decisions. However, some research suggests that adults may actually feel *more* “invulnerable” to risks than adolescents (e.g., Millstein and Halpern-Felsher 2002a, 2002b; Quadrel, Fischhoff, and Davis 1993). Indeed, adolescents have reported greater personal risks for negative events (e.g., injury, having an accident while driving drunk) than young adults (Millstein and Halpern-Felsher 2002a, 2002b). This work suggests that adolescents are not relatively more optimistic in their risk assessments. Such evidence sheds doubt on the idea that faulty decision-making skills are solely to blame for adolescents’ increased risk-taking tendencies.

Second, recent work has demonstrated that skills other than cognitive ability predict a number of developmental outcomes in both the economic (e.g., Borghans et al. 2008; Cunha and Heckman 2009; Heckman 2008; Heckman, Stixrud, and Urzua 2006) and psychological literatures (e.g., Ozer and Benet-Martínez 2006; Lodi-Smith and Roberts 2007; Roberts et al. 2007). For example, personality traits appear to predict significant life outcomes (e.g., divorce, occupational attainment, and mortality) as well as socioeconomic status or cognitive ability (Roberts et al. 2007). Moreover, there is evidence that emotional and behavioral skills motivate cognitive skill development, but the reverse does not appear to hold (Cunha and Heckman 2008). Therefore, not only do psychological factors other than cognitive ability predict developmental outcomes, but they also may indirectly influence outcomes through promoting cognitive development.

Economists refer to these as “noncognitive” factors, which, taken literally, is nonsensical from several perspectives. What is really meant by the term “noncognitive” is “all things that are not cognitive ability,” which is quite a bit different from the literal meaning of noncognitive. Many of the factors other than cognitive abilities are clearly cognitive in nature. When people set goals they clearly think about what they want or desire. Thus, the term needlessly characterizes everything that is not cognitive ability as an omission (i.e., “non”).

Rather than lump all sources of individual heterogeneity that are not measured by IQ tests into a single category, it is useful to separate these characteristics and skills more finely. There are fields, terms, and systems already in place that are used to be more descriptively accurate. Several of the authors of this chapter refer to themselves as personality psychologists, which is a field that subsumes all individual differences, including cognitive abilities. Although there are several alternatives, we have proposed that there are at least four categories of individual differences contained within the study of personality: cognitive abilities, personality traits, motivations, and narratives (Roberts and Wood 2006). We have distinguished among these four domains because constructs found within each grouping tend to be conceptually and empirically distinct. Or, to put it in terms similar to the ideas outlined by economists, important life achievements, such as status in work or marital stability, can be predicted independently from IQ, personality traits, motives, and individual experience (narratives; Roberts et al. 2007).

A third reason the sole focus on cognitive ability is problematic is that research has consistently demonstrated that psychological factors other than cognitive ability predict one's likelihood for delinquent action (for a review, see Dodge, Coie, and Lynam 2006; Hirschi 1969). For example, in a sample of sixth- to tenth-graders, personality traits significantly predict a number of antisocial behaviors, including conduct problems, aggression, and symptoms of antisocial personality disorder (Miller, Lynam, and Leukefeld 2003). In that study, facets of conscientiousness, neuroticism, and particularly agreeableness were strongly related to these antisocial outcomes. Similarly, evidence suggests that delinquents' personality traits predicted their likelihood to recidivate (Steiner, Cauffman, and Duxbury 1999).

When one examines the effect sizes associated with various risk factors for crime it is hard to understand why research has focused so strongly on cognitive ability. Table 8.1 provides representative effect sizes from several reviews and meta-analyses examining the relative importance of different risk factors (Cottle, Lee, and Heilbrun 2001; Gerard and Buehler 2004; Loeber et al. 2007). Although statistically significant predictors, cognitive and environmental factors typically have effect sizes that are relatively modest in nature. In contrast, factors such as "nonsevere pathology" (e.g., stress and anxiety; Cottle, Lee, and Heilbrun 2001), hostility (Loeber et al. 2005), and impulsiveness (Farrington, Ttofi, and Coid 2009) are as important if not more important than cognitive ability. For example, compare the results in table 8.1 to the magnitude of the correlations found by Miller, Lynam, and Leukefeld (2003) between personality facets and the stability of conduct problems: neuroticism ( $-.02$  to  $.30$ ), agreeableness ( $-.06$  to  $-.47$ ), and conscientiousness ( $-.15$  to  $-.35$ ). Indeed, these correlations are often stronger in magnitude than several of the risk factors assumed to be most important for predicting delinquency. Overall, it is clear that intervention research must move past the sole focus on cognitive factors.

The existence of factors other than cognitive ability that predict criminality and delinquency invites questions about the ability to intervene and change these characteristics. The potential for intervening to change the personalities of children and adolescents rather than intervening to change abilities was made clear recently by work with the Perry Preschool Project (Heckman, Malofoera et al. 2009; Heckman, Moon et al. 2009; Heckman, Moon, Pinto et al. 2009). The Perry Preschool Project is a well-known intervention program that was intended to promote academic skill development among at-risk youth. The effects of the intervention in the Perry Preschool Project on cognitive skills were relatively disappointing, with no evidence for long-term differential gains in academic or cognitive skills. However, recent analyses have demonstrated that intervention participants outperformed nonparticipants on a number of important life outcomes, such as employment and criminal behavior. Heckman and colleagues found that cognitive ability factors contribute relatively little to these outcomes, and concluded instead that the Perry Preschool Program seemed to benefit its participants

**Table 8.1**                    **A comparison of cognitive, environmental, and noncognitive predictors of different criminality outcomes in selected studies**

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*Predicting moderate/serious delinquency in males (Loeber et al. 2007)*

Cognitive factors (top four)	
High verbal IQ	-.16
Good performance on Continuous Performance task	-.13
Low delayed visual memory	.12
Low immediate visual memory	.11
High delayed verbal memory	-.10
Child factors (top five)	
High marijuana use	.43
High drug selling	.42
High truancy	.39
High alcohol use	.37
High tobacco use	.34
Family factors (top three)	
High parental supervision	-.22
High parental stress	.13
Low positive parenting	.12
Peer factors	
High peer delinquency	.36
Community factors (top four)	
Low community crime (youth report)	-.26
Good housing quality	-.19
Low community crime (parent report)	-.18
Poor housing quality	.07
<i>Predicting desistance from delinquency in males (Loeber et al. 2007)</i>	
Cognitive factors (top three)	
Low immediate visual memory	.12
High spatial IQ	-.06
Poor performance on Continuous Performance task	.06
Child factors (top five)	
High interpersonal callousness	.18
High tobacco use	.16
High drug selling	.14
High alcohol use	.13
High perceived likelihood of being caught	.12
Family factors (top four)	
High parental supervision	-.07
High parental stress	.05
High physical punishment	.04
High positive parenting	-.03
Peer factors	
High peer delinquency	.18
Community factors	
Low community crime (parent report)	-.10
Poor housing quality	.07
High community crime (youth report)	.04
High community crime risk (parent report)	.02
<i>Predicting recidivism (meta-analysis by Cottle, Lee, and Heilbrun 2001)</i>	
Cognitive factors (top five)	
Standardized achievement score	-.15
Full scale IQ score	-.14
History of special education	.13
Verbal IQ score	-.11
Performance IQ score	-.03

**Table 8.1** (continued)

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Child factors (top five)	
Nonsevere pathology (e.g., stress, anxiety)	.31
Conduct problems	.26
Effective use of leisure time	.23
Substance abuse	.15
Severe pathology	.07
Family factors	
Family problems	.28
History of abuse	.11
Single parent	.07
Parent pathology	.05
Peer factors	
Delinquent peers	.20
<i>Predicting conduct problems (Gerard and Buehler 2004)</i>	
Cognitive factors	
Scholastic achievement	-.24
Child factors	
School detachment	.33
Self-esteem	-.20
Perceived prejudice by students	.08
Family factors (top five)	
Family detachment	.31
Parent's relationship quality	-.17
Parent's marital status	-.13
Parental involvement	-.13
Household size	.10
Peer factors	
Trouble with peers	.20
Peer support	-.17
Community factors	
Neighborhood satisfaction	-.13
Neighborhood safety	-.09
Neighborhood quality	-.07
Neighborhood problems	.07
<i>Predicting stability of conduct problems from personality (Miller, Lynam, and Leukefeld 2003)</i>	
Neuroticism (top five)	
Angry hostility	.30
Impulsiveness	.22
Depression	.15
Self-consciousness	.02
Vulnerability	.03
Agreeableness (top five)	
Straightforwardness	-.47
Compliance	-.37
Altruism	-.30
Trust	-.24
Tendermindedness	-.12
Conscientiousness (top five)	
Deliberation	-.35
Dutifulness	-.23
Competence	-.22
Achievement striving	-.15
Self-discipline	-.15

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primarily through its effect on personality factors. This work provides a clear example of the importance of personality variables, given that the program would largely be viewed as unsuccessful if one looked only at cognitive ability outcomes. It also highlights the fact that psychological factors other than cognitive ability, such as personality, are a potential fruitful focus for intervention research. These attributes appear to be changeable, especially in childhood and adolescence, and the changes gained through intervention lead to concrete gains in human capital above and beyond cognitive ability and socioeconomic status. We therefore suggest that interventions that focus solely on cognitive skills, though sometimes beneficial, may fail to address the totality of the effective ways to intervene to diminish the likelihood of criminal behavior. In the following review, we provide an overview of interventions that focus on changing psychological factors other than cognitive ability.

## **8.2 Outline for the Review**

Two issues often bias reports of intervention results. First, most evaluations of intervention efficacy are performed by the developers of the intervention program. Accordingly, such results can be colored by the researchers' desire to find positive results of their hard work. Second, given the costs involved in testing interventions, researchers often employ smaller samples for evaluation tests, leading to questions regarding their generalizability or lack of statistical power. For these reasons, we focus on reviewing only those studies that have garnered "strong" empirical support. We followed two criteria for defining strong support: (a) that any positive results for a program (or program category) have been replicated at least once; (b) that support for a program has come from multiple research groups.

To help address these issues, we let past meta-analyses of the literature guide our review. It is worth noting that these guidelines often paint a different picture than that portrayed in the literature. One prominent example is the frequent assumption in the literature that longer interventions should have more significant effects (Dodge 2008; Kazdin 1987). However, meta-analyses of intervention efficacy have been more equivocal on this topic; some fail to demonstrate a significant effect for study duration (e.g., Garrard and Lipsey 2007; Wilson and Lipsey 2007), while others do find a "dosage" effect (Lipsey and Wilson 1998). Given this discrepancy, and the emphasis that has been placed on study duration in the literature, we first classified interventions according to whether they were short-term or long-term in nature. In one meta-analysis of interventions across multiple domains, the median study duration was twenty-one to thirty weeks (Lipsey and Wilson 1998). Accordingly, we considered interventions with an average duration of up to six months (about twenty-six weeks) to be short term, and any intervention that exceeds this threshold to be long term.

Such an approach also has inherent value for economic analyses of these interventions. Given that only a few of the interventions discussed have yet to receive formal cost-benefit analysis, duration period provides at least some indication of the inherent costs. Long-term interventions have greater costs than short-term ones, and therefore, need to demonstrate larger effects in order to be cost-effective. To this end, we characterize the reviewed literature according to its duration, and whether it has demonstrated consistent support. In table 8.2, we provide an organizing framework for our review, showing how we classified the different intervention programs according to these two factors. It is worth noting that most interventions were short term in nature, as one would expect given the costs of long-term approaches. More often than not, it appears that efficacy is not contingent upon duration. Indeed, several short-term interventions have demonstrated consistently positive effects.

Moreover, in table 8.2, we have included the estimates of benefits associated with some of the interventions we review from a recent comparison of the costs and benefits of different intervention programs (Drake, Aos, and Miller 2009). As noted, only a subset of the reviewed interventions has received cost-benefit review. Indeed, even some of the studies reviewed did not have appropriate benefit *and* cost information, as noted by the asterisks in the table. In addition, programs such as boot camps look somewhat beneficial; however, this program demonstrated no benefits and only reduced costs compared to institutionalization. To preface our remarks following, this work does coincide with the results of the studies and meta-analyses, as many of the programs that we label as “positive” also are cost-effective.

**Table 8.2** A framework for reviewing noncognitive interventions

Positive	Negative/inconclusive
Short-term	
School-based	Juvenile awareness programs
After-school programs	“Scared Straight” (–\$17,470)
Social skills training	Prison visits
Family interventions	Boot camps (\$8,325)
Parent management training	Incarceration
Functional family therapy (\$49,776)	Job and vocational training
Multisystemic therapy (\$17,694)	
Multidimensional treatment foster care (\$88,953)	
Health-based intervention	
Long-term	
Olweus Bullying Program	Positive youth development
Life skills training <sup>a</sup>	Prison-based interventions
Seattle Social Development Program <sup>a</sup>	Social cognitive skills training

<sup>a</sup>Indicates no viable information for either costs or benefits in the Drake, Aos, and Miller (2009) review.



Those programs labeled as “negative” exhibit little to no benefits, and thus have poorer cost-benefit ratios. In sum, the little extant cost-benefit work does correspond to our determination of intervention efficacy, and when available, we report program-specific cost-benefit studies in the following.

Within these four cells, we also limited our review to interventions that attempted to intervene on psychological risk factors other than cognitive ability or environmental factors, such as poverty. In this effort, we tried to be as inclusive as possible, and it became clear that many of the interventions focus on proximal mechanisms that researchers presume they can change. So, for example, researchers may focus on improving “aggressive cognitions,” not on “aggression” per se, because the trait of aggression incorporates its cognitive nature as well as the biological, behavioral, and emotional factors involved (see Roberts and Jackson 2008). While this seems a reasonable approach, it creates an interesting mismatch between the risk factors to crime and delinquency and the focus of psychologically-oriented interventions. Most of the risk factors appear to be relatively stable personality factors that are akin to cognitive ability. That is, they are difficult to change. Yet the interventions focus on components of those personality domains that are presumed to be more changeable. It is unclear whether the target of many of the interventions results in change on the psychological risk factors most consistently linked to criminal outcomes. We will return to these ideas in our summary.

### **8.3 Short-Term Positive Interventions**

Short-term promising interventions can be generally classified into four sections. First, a number of programs have addressed antisocial behavior from the classroom, likely because schools provide researchers with easy opportunities to sample several youth in one setting. Second, programs have addressed the social skills of youth, given the strong influence that peers have on youth delinquency. Third, intervening in the family system often demonstrates positive outcomes. Fourth, recently, some more provocative studies have demonstrated that changes in nutrition might have an impact on aggression and delinquency.

#### **8.3.1 School-Based Programs**

Given that school-based programs are among the more frequently employed, this area has received more attention in literature reviews and meta-analyses (e.g., Garrard and Lipsey 2007; Gottfredson et al. 2004; Wilson and Lipsey 2007). We therefore focus on the overarching themes presented by these reviews. Before discussing specific study characteristics, a clear emphasis espoused by this literature is the need for rigorous implementation. For example, in one meta-analysis, the average effect size for well-implemented

school-based conflict resolution programs was .42, compared to .04 to .08 for programs that experienced some implementation problems (Garrard and Lipsey 2007). Indeed, more than any other variable, it has been suggested that the best predictor of efficacy in school interventions is the school's ability to carry out the intervention (Wilson and Lipsey 2007).

When evaluating more specific characteristics, one of particular interest is the student's age. For interventions within the family system, it has been frequently suggested that early interventions are preferable (e.g., Cummings, Davies, and Campbell 2000; Greenberg, Domitrovich, and Bumbarger 2001), because it is best to address parenting or family issues before they have become too ingrained. Evaluations of school-based interventions, however, have provided more equivocal results. When examining the effects of conflict resolution education on antisocial behavior, older children have been shown to benefit *more* than younger children (Garrard and Lipsey 2007). However, the results are more nuanced when considering interventions for aggressive behavior (Wilson and Lipsey 2007). If these programs are implemented universally (to classrooms as a whole), they tend to work better with younger students. Programs that target at-risk or problem youth, however, show no systematic age differences. While such results are clearly mixed, we point them out to counter the frequently held belief that interventions *must* start in childhood to prove effective. On the contrary, some interventions appear to work better for adolescents.

This claim also receives support from the literature on after-school programs. One review of the literature suggests that participation in these programs was effective in reducing delinquency among older (grades 6 through 8) students but not for younger (grades 4 through 5) students (Gottfredson et al. 2004). The reviewed programs all included academic and social skills development, as well as recreational services. When looking at the mediators of these effects among older students, the results presented two possibilities. First, after-school program participation was positively related to intentions to *not* use drugs. Second, there is some evidence that these programs also promote positive peer associations. Moreover, the intervention effect sizes were greatest for those programs that emphasized social skills and character development. These results suggest that after-school programs might be effective not because they emphasize academic skills or participation in constructive activities, but rather because they decrease youths' intentions to use drugs and promote their social competence.

Promoting positive peer relations is an important theme for conflict resolution programs in the school as well. Interventions that include peer mediation appear to demonstrate stronger effect sizes, although such programs are few in number (Garrard and Lipsey 2007). Broadly speaking, conflict resolution programs are generally quite effective in reducing antisocial behavior among youth. The efficacy of conflict resolution programs is most likely the result of their focus on interpersonal and behavioral skills, which have dem-

onstrated some promise in reducing problem behavior, both in and outside of the school environment.

### 8.3.2 Social Skills Training

A wealth of research has demonstrated the effects of peer influence on delinquency and risky decision making (e.g., Dishion 2000; Elliott and Menard 1996; Gifford-Smith et al. 2005; Thornberry and Krohn 1997). Indeed, Thornberry and Krohn (1997) suggest that the negative effects of associating with deviant peers are among the most replicated findings in the field. As noted before, documented increases in delinquency following ineffective interventions might result from the fact that these programs congregate deviant adolescents together. It thus is not surprising that Lipsey and Wilson (1998) suggest that treatments that emphasized interpersonal skills are among the most effective both for institutionalized and noninstitutionalized juvenile offenders.

Social skills training (SST) was initially employed for use with psychiatric patients (e.g., Argyle 1969), but was adapted for work with delinquents soon thereafter. 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. Some of the initial work on SST found that it had positive effects on basic social interaction skills (Spence and Marzillier 1979), but that its long-term effects on social problems were more mixed (Spence and Marzillier 1981). One SST program that has demonstrated efficacy is Aggression Replacement Training (ART) (Glick and Goldstein 1987). Over a ten-week period, intervention participants were taught moral education, anger control skills, and other social skills, such as basic social interaction abilities, stress-coping skills, planning skills, and dealing with feelings. These skills were taught through a combination of observation, discussion, and role-playing in which individuals learned more effective behavioral responses to anger. Compared to controls at post-test, intervention participants had fewer behavioral incidents and scored lower on impulsiveness. They also scored better on a number of social skills, including expressing complaints, keeping out of fights, and responding to anger; moreover, there was evidence that intervention participants were also able to transfer these skills to different contexts. A second study with youth who committed serious crimes replicated some but not all of these results. Another social skills program, ASSET, has similarly reported decreases in recidivism among the intervention group, and retention of social skills at eight-month follow-up (Hazel et al. 1981, 1982).

However, there are some conflicting results on social skills interventions. For example, Bailey and Ballard (2006) found few differences between intervention and control groups across a variety of outcomes. In their discussion, they note that the ten-week program might not be long enough to allow for real, consequential skill development. Another possibility is that social

skills programs might work best if included as part of a broad approach. For example, Serna, Schumacher, Hazel, and Sheldon (1986) found promising results for a program that taught social skills to both adjudicated youth and their parents.

These results point to two important conclusions. First, while the broad category of “social skills training” has received empirical support from multiple labs, as well as support from meta-analyses, the results of individual social skills programs have been more mixed. Second, it seems that social skills programs might work best when implemented in tandem with other types of interventions. As noted before, school programs with social skills training were among the more efficacious. Moreover, social skills might be taught best within the family. As with most things, social interactions are first taught in the home.

### 8.3.3 Family Interventions

One common thread in the developmental research on delinquency is the importance placed on the family environment. Several family indicators have been invoked as possible risk factors for delinquency and conduct disorder, such as being raised by a single parent, marital troubles between parents, and parental drug use and depression (e.g., Brandt 2006; Hirschi 1969; Loeber 1990; Loeber and Farrington 2000). The family system often serves as a primary predictor of many developmental and behavioral problems and is integrally tied to the other subsystems discussed here (for a review, see Cummings, Davies, and Campbell 2000). Accordingly, it appears as though family therapy works best when part of a multifaceted approach (Lipsey 1999), which we discuss with respect to broad interventions. However, a few more narrow family counseling programs have demonstrated promise.

One example is parent management training (PMT), which focuses on teaching parents better disciplinary techniques (Kazdin 2005). Typically, such programs ask parents to meet with therapists, and they work together to decide on appropriate punishment programs for their children, and on how to be more responsive to the child’s needs. These techniques have received widespread empirical support (e.g., Eyberg, Nelson, and Boggs 2008; Kazdin 2005; Nixon 2002), and work well with children who have conduct or externalizing problems (Brestan and Eyberg 1998; Hautmann et al. 2009). Unlike the research on school-based interventions, parental training programs tend to be most efficacious when implemented with parents who have younger children, as it is best to address parenting issues earlier rather than later.

One program though that has shown consistent efficacy with adolescents is functional family therapy (FFT) (Alexander and Parsons 1982; Sexton and Alexander 2000). Functional family therapy works with the family unit as a whole to promote more positive family interactions and problem-solving. Desired outcomes include more empathetic responding to family

members, better discussions of family issues, and general family cohesion. On average, families take part in twelve sessions over the course of three months, mostly occurring within the home. Results have consistently supported FFT as a means for decreasing problem behavior and recidivism (e.g., Alexander and Parsons 1973; Gordon et al. 1988). For example, when looking at misdemeanors and felonies, Gordon, Graves, and Arbuthnot (1995) reported an 8.7 percent recidivism rate for FFT delinquents compared to 40.9 percent for the comparison youth at thirty-two-month follow-up. These studies provide support that FFT is among the best performing short-term programs with respect to its long-term effects on recidivism.

Two additional programs are worth noting that tend to be more comprehensive in nature. Given the intensive nature of these two interventions, researchers have been more interested in their cost-benefit analysis compared to the aforementioned interventions. We note these analyses following, but generally speaking, they do appear to be relatively cost-effective. Accordingly, we count them among the interventions that have “worked.”

### *Multisystemic Therapy*

Multisystemic therapy (MST) was initially developed by Henggeler and colleagues (Henggeler and Borduin 1990; Henggeler et al. 1998) in an effort to treat severely antisocial children and adolescents (typically around fourteen to sixteen years old). It is assumed that those youth who enter into MST have multiple issues across multiple domains, which necessitates intensive therapy. Each program is individually tailored to the adolescent, and typically starts with daily sessions that become less frequent over the three- to five-month course of treatment (Burns et al. 2000). Due to this flexibility, this program avoids the issues mentioned earlier with respect to job and vocational training; namely, that programs drafted for the population writ large may fail to address the individual needs of the specific juvenile delinquent.

The MST was conceptualized according to the ideals of Bronfenbrenner’s (1979) ecological systems theory. Bronfenbrenner strongly emphasized that a child’s development cannot be accurately viewed by examining it within a single domain. Instead, development occurs within several subsystems and the more proximal systems (e.g., family, school, friends) are all interconnected, which also follows from systems theory (Plas 1992). Moreover, these proximal systems are subsumed within the broader context of the child’s environment (culture, government, economy). Accordingly, MST treats the delinquent by considering his or her problem within the broader context of these interrelated and hierarchical systems, rather than focusing more narrowly on a single domain. Indeed, Bronfenbrenner’s theory can be viewed as the general rationale behind why broad interventions are generally preferable to narrow ones.

The MST programs have received widespread empirical support for their

efficacy in reducing behavioral problems. Studies suggest that MST generally leads to fewer rearrests, less drug use, and decreased incarceration and drug use in comparison to usual juvenile justice services (Henggeler et al. 1991; Henggeler, Melton, and Smith 1992). Among first-time offenders, it leads to decreased delinquency and reoffending, and to increased school and family functioning (Sutphen, Thyer, and Kurtz 1995). Moreover, MST effects have been demonstrated more than two years after intervention (Henggeler et al. 1993), and one study reports that MST decreased recidivism by 50 percent in comparison to individual therapy at follow-up over a decade postintervention (Schaeffer and Borduin 2005).

Given the consistent evidence for its efficacy, research has investigated the possible costs involved in widespread implementation of MST. The typical cost per child ranges from \$4,000 to \$12,000 per child (Brown et al. 1997; Schaeffer and Borduin 2005; Sheidow et al. 2004). While these costs are prohibitive enough to discourage large-sample evaluations of MST, this is relatively cheap in comparison to traditional juvenile justice services (i.e., incarceration). Indeed, MST was the most cost-effective intervention for juvenile offenders among the eleven programs reviewed by the state of Washington (Washington State Institute for Public Policy 1998).

#### *Multidimensional Treatment Foster Care*

The MST programs sometimes are implemented as a last resort before having to displace the juvenile offender. However, when the adolescent needs to be removed from his or her home, one of the most effective options is to place them in multidimensional treatment foster care (MTFC) (Chamberlain and Reed 1998; Fisher and Chamberlain 2000). As part of this program, children are taken from their homes and placed in foster care until they reach a set of behavioral benchmarks. After return to their natural family, counseling is provided on a need basis in the following months. Given the intensive nature of this program, some youth can stay in the program for nearly two years. However, Leve and Chamberlain (2005) reported that the average intervention dosage was around six to seven months in their study.

When in foster care, intervention participants are cared for by several personnel both in and out of the foster home. The first line of treatment comes from the foster parents, who provide consistent positive reinforcement when encouraging social, prosocial, and personal skill development. In addition, youth are provided with opportunities for counseling, and a behavior support specialist to help modify their social interaction skills. While the youth is presented with these opportunities in foster care, the child's natural family also receives therapy sessions to indoctrinate a more positive family environment. A case manager or team supervisor oversees all of these activities, which is particularly important given the number of people involved in this type of intervention.

The MTFC interventions have consistently demonstrated promise for reducing delinquency and recidivism. Boys in the intervention committed fewer delinquent actions after one year, and fewer serious offenses at the two-year follow-up than nontreated youth (Chamberlain and Reed 1998; Eddy, Whaley, and Chamberlain 2004), and similar trends have been reported with girls as well (Chamberlain, Leve, and DeGarmo 2007; Leve and Chamberlain 2004; Leve, Chamberlain, and Reid 2005). Mediators of these effects include supervision efficacy, disciplinary practices, and decreased exposure to deviant peers (Eddy and Chamberlain 2000; Leve and Chamberlain 2005). Such results again speak to the importance of consistent intervention implementation, and the negative effects of deviant peer association.

While MTFC interventions are quite intensive in nature, studies do suggest that they are generally cost-effective. When considering the costs of prevented crimes and incarcerations, Aos et al. (1999, 2001) report that MTFC saves taxpayers from \$21,836 to \$87,622 per youth (reported in Chamberlain, Leve, and DeGarmo 2007). As another mark of its effectiveness, researchers have begun to modify MTFC programs to instruct regular foster care parents as well (Price et al. 2009). Preliminary results suggest that MTFC might be effective not only for reducing problem behavior among youth needing intervention, but also for use with “normal” foster-care children.

### 8.3.4 Health-Based Interventions

Among the more provocative efforts toward reducing crime have been those that target the participants' nutrition. For centuries, it was assumed that psychological issues resulted from physical or nutritional problems. With the advent of more modern psychological theories, researchers have moved toward new methods for treating mental and behavioral problems. However, in doing so, researchers may have overly discounted the role of physical health on mental health. Indeed, evidence continues to accumulate in favor of the idea that diet can have a profound influence on mood (Kaplan et al. 2007), as well as on antisocial and criminal behavior (Benton 2007).

For example, one line of work has demonstrated that providing participants with essential fatty acids (EFA), often found in fish oil, can decrease levels of aggression (e.g., Gesch et al. 2002; Hamazaki and Hamazaki 2008; Itomura et al. 2005; Buydens-Branchey, Branchey, and Hibbeln 2008). In an initial study, young adult prisoners who were given vitamin supplements (which included, among other things, essential fatty acids) demonstrated significant decreases in violent prison offenses compared to a placebo group (Gesch et al. 2002). Fatty acid supplements have also been shown to decrease both aggression in young girls (Itomura et al., 2005), as well as anger and anxiety in substance users (Buydens-Branchey, Branchey, and Hibbeln 2008). One reason why these effects may occur is because these

supplements help participants' serotonergic functioning (Hamazaki and Hamazaki 2008). Serotonin deficiency is related to increased impulsive behavior (Mann 1999), and such deficiencies have been linked to decreased intake of fatty acids. Therefore, providing individuals with needed fatty acids might help those with underdeveloped serotonergic systems, who otherwise would be predisposed to aggressive behavior.

Similarly, work has suggested that correcting chemical imbalances and vitamin deficiencies can reduce antisocial behavior. In a study of patients diagnosed with a behavioral disorder, researchers found that a majority had clear chemical imbalances (Walsh, Glab, and Haakenson 2004). The researchers then provided participants with supplements designed specifically for each individual. Participants showed significant decreases in assaultive and destructive behaviors after four to eight months of treatment. It is worth noting that, given the idiographic nature of the intervention, the authors did not employ a placebo group. However, these results are promising for future efforts to decrease behavioral disorders through biochemical interventions.

Before concluding this section, it is interesting to note how these studies might relate to cognitive interventions. One longitudinal study found that malnutrition at age three predicted behavioral problems at ages eight, eleven, and seventeen (Liu et al. 2004). This link was mediated at ages eight and eleven by participants' cognitive ability, but this was not true for the results at age seventeen. Clearly these results point to the long-term importance of nutrition on externalizing behavior. Moreover, they suggest that it might prove as efficacious to provide early interventions for nutrition, as it is to provide early cognitive interventions. If nutrition influences cognitive ability, which in turn decreases problem behaviors, it seems that one can better address the problem by intervening at the "root." This speculation is supported further by the fact that the mediational tests were not significant at age seventeen, suggesting that the long-term effects of malnutrition on externalizing cannot be fully explained by cognitive ability.

### 8.3.5 Summary

In summary, four areas provide promise for addressing issues of antisocial behavior using relatively short-term interventions: school, social skills, family, and nutrition. Of the four, the area most in need of future work appears to be social skills interventions; the category as a whole appears effective, but there is greater uncertainty at the individual program level. While all benefit economically from being short in duration, it does appear that some clearly cost more than others. For example, providing necessary nutrients involves little to no labor (other than possibly the initial diagnosis stage) and few institutional resources. On the contrary, intensive therapy programs such as MTFC will cost much more per participant. However, one might also expect such programs to demonstrate larger effects. Future research is



certainly needed to provide cost-benefit comparisons between these short-term interventions, especially given their disparate nature.

#### **8.4 Short-Term Interventions with Negative and Inconclusive Effects**

As noted before, most intervention programs tend to be short-term in nature, given the lesser costs involved in their implementation. Not surprisingly then, there are nearly as many ineffective short-term programs as there are effective ones. Unfortunately, in some cases, these ineffective programs have received as much or more media acclaim as the effective ones. This likely has been one reason behind their perseverance in the face of their disappointing results. Most of these programs can be characterized as being “tough” on delinquency, which can often lead to results opposite of those intended.

##### **8.4.1 Juvenile Awareness Programs, Boot Camps, and Incarceration**

Possibly the most publicized interventions are those that either incarcerate youth or attempt to rehabilitate them by scaring them with that possibility. The documentary “Scared Straight!” (Shapiro 1978) and its subsequent sequels brought widespread attention to efforts toward this latter goal. Accordingly, most people would be surprised to learn that these programs have received almost no empirical support, and that some of these programs may even promote increased delinquency (e.g., Finckenauer 1982; Finckenauer and Gavin 1999; Petrosino, Turpin-Petrosino, and Buehler 2003).

Petrosino, Turpin-Petrosino, and Buehler (2003) reviewed the literature on juvenile awareness programs, a category that broadly includes all programs for which juvenile delinquents are confronted with the prison environment (either through prison visits or interactions with prisoners). They chose only those studies that randomly assigned delinquents into no-treatment control or intervention (awareness) groups. In a meta-analysis of recidivism rates, the authors found that delinquents placed in the intervention programs were actually *more* likely to recidivate than those in the control groups. Indeed, none of the reviewed programs demonstrated a decrease for the intervention group. Lipsey (1992) reported similar results in his meta-analysis of these programs, suggesting that intervention participants were on average 7 percent more likely to recidivate than controls. Moreover, it appears to be even less effective to actually imprison delinquents than to simply scare them with the possibility. Multiple studies have reported recidivism rates for adjudicated youth at or above 50 percent (e.g., Beck and Shipley 1987; Snyder and Sickmund 2006).

A fellow traveler to these programs is the “boot camp” intervention. The boot camp approach places delinquents in a militaristic lifestyle, assuming that increased discipline and structure should promote self-control and decrease future recidivism (e.g., Empey, Stafford, and Hay 1999; Gottfred-

son and Hirschi 1990). Similar to juvenile awareness programs, the primary assumption underlying the boot camp approach is that it will scare first-time delinquents out of pursuing lifelong criminal activity (MacKenzie and Parent 1991). However, these programs also have proven largely ineffective in reducing recidivism (e.g., Burns and Vito 1995; Jones 1996; MacKenzie 1991; MacKenzie and Shaw 1993). Some studies even suggest that these programs may even have detrimental effects (Jones and Ross 1997; Morash and Rucker 1990).

Another widely publicized program that has received little to no support is DARE (Drug Abuse Resistance Education). The DARE programs attempt to decrease drug use largely through informing students of its prevalence and inherent risks. However, ever since DARE programs were introduced in 1983, most evaluations of their efficacy suggest that they either have no effect or in fact increase drug use (Lynam et al. 1999; MacKillop et al. 2003; Werch and Owen 2002). Indeed, Lilienfeld (2007) recently provided DARE as an example of a program that “does harm” to its participants.

Why do these programs perform so poorly? And furthermore, why do programs with so little empirical support continue to receive government funding? With respect to the first question, one issue is that delinquents are subject to a variety of iatrogenic effects (Rhule 2005). Once one has been labeled as an adjudicated youth, this can lead to differential treatment by those in the youth’s social environment (Caprara 1993; Dweck and Leggett 1988). People in the community are likely to treat the adjudicated youth as less competent and trustworthy, which significantly complicates the readjustment process postintervention. Indeed, others in the community are more likely to make negative attributions of the delinquent’s actions (Dodge 1980), and in turn may be more prone to aggression toward the child (Dodge and Frame 1982). Finally, by congregating antisocial youth together in intervention groups, they might adopt more negative social norms because they now view antisocial activities as more ubiquitous and socially acceptable (e.g., Morash and Rucker 1990; Stormshak et al. 1999). Youth in this situation also might increase antisocial behavior in an effort to “prove” to peers that the youth was not deterred or scared by the program.

With respect to the second question, a few reasons have been suggested regarding why these programs persist despite a lack of empirical support (Finckenauer 2005). One follows from the field’s general focus on cognitive ability factors. If one believes that delinquent activities result from deliberative decision making, it seems logical that adolescents would engage in fewer risky actions if the negative consequences of these actions were made more salient. Another issue involves what is meant by program “efficacy.” As demonstrated by the public interest in the “Scared Straight” documentaries, it is easy to get people to believe in a program by reporting on individual success stories. Compelling anecdotes lead people to believe that programs are making a difference if they can help “just one person.” Finally, these

programs, especially boot camps, have inherent appeal for those who believe that we need to “get tough” on delinquents. People who believe in a strict morality are likely to approve of these seemingly harsher penalties (Lakoff 2002), regardless of their lack of empirical support. This claim also provides rationale for why school suspensions and expulsions continue despite the fact that they often fail to reduce school violence (Skiba 2002).

#### 8.4.2 Job and Vocational Training

Counter to these approaches that take a hard line on delinquency, some programs seek to reduce delinquency by motivating youth toward more adaptive life commitments. Research frequently suggests that having adolescents commit to age-appropriate roles can decrease their likelihood for delinquency (Hirschi 1969; Laub and Sampson 2003; Sampson and Laub 1993). However, adolescents who prematurely adopt adult roles might actually be more likely to commit delinquent acts (Hirschi 1969). One example of an adolescent-appropriate role commitment is their entry into the workplace. Accordingly, research frequently has examined whether job training and vocational programs might help reduce delinquency.

Generally, the results of such programs are equivocal at best. In a meta-analysis of studies with juvenile offenders, job skills programs were found to have limited effects on recidivism (Lipsey 2009). Another meta-analysis suggests that vocational education programs may even increase recidivism rates (Lipsey and Wilson 1998; see also Bloom et al. 1994). Two points temper any strong negative conclusions. First, employment-related programs appear more efficacious for noninstitutionalized than for institutionalized offenders (Lipsey and Wilson 1998). Second, there is great variability in this area with respect to program goals and methodological rigor, which can influence their reported effectiveness (Bouffard, MacKenzie, and Hickman 2000). Given these points, it is difficult to make any broad conclusions regarding job-training programs other than that they work for some delinquents some of the time.

#### 8.4.3 Summation

The current section makes two important points. First, some short-term interventions work. It is clearly not the case that small investments must necessarily result in small rewards. Changing nutrition or working with families are interventions that can be done in an expedient manner, and they appear to have lasting effects on criminal behavior. Second, not all short-term interventions work; while duration is important in determining cost, it is less important for efficacy than the content of the intervention and how well it is implemented. Before drawing firm conclusions we examine the longer interventions. Afterwards, we will discuss common features of effective interventions regardless of duration.

## 8.5 Long-Term Positive Interventions

We now discuss interventions that take longer than six months on average. It clearly requires more resources in general to implement these interventions, but more time is also required before strong conclusions can be drawn regarding their long-term benefits. Accordingly, less empirical support is available for these programs, and it is rare to find any that have been replicated by researchers outside of the lab that first created them.

Moreover, given the relative lack of evaluations of long-term interventions, long-term interventions also are underrepresented in meta-analyses. We therefore sought other sources for direction in selecting studies to review, and decided to follow the suggestions of the “Blueprints for Violence Prevention” program at the University of Colorado (Center for the Study and Prevention of Violence 2009). The Blueprints program has evaluated hundreds of interventions and has nominated a few programs as being either “models” or “promising” for decreasing violent and antisocial behavior. In the following, we review three of these programs as our examples of long-term positive interventions. It is worth noting that some of the short-term interventions mentioned earlier were also nominated, including multi-systemic therapy, multidimensional treatment foster care, and the Perry Pre-school Project.

### 8.5.1 Olweus Bullying Program

We begin this section with one of the most consistent and well-received intervention programs to reduce aggressive behavior. The Olweus Bullying Program (Olweus 1993, 1994, 1995) seeks to reduce bullying in schools using a multifaceted approach with training for students, teachers, and parents. The Olweus Program seeks to address the problem of bullying by first dissuading some myths on the topic. For example, bullying does not occur because of larger class sizes, failure in school, or differences in students’ appearances. Instead, bullies are marked by their generally aggressive and antisocial dispositions, an important point given its implications for interventions.

At the school level, teachers receive training to better diagnose and monitor bullying behavior. They also are taught how to engender better social skills among their students. In class, students engage in role-playing scenarios and cooperative groups to practice better social interactions. When bullying does occur, either in the classroom or on the playground, teachers have serious discussions with both the bully and victim. It is of the utmost importance that teachers do not allow even minor cases of bullying behavior to persist in the classroom. Moreover, teachers report these problems to the parents of the students, who also play an important role in discouraging bullying behavior.

At the family level, parents also receive training on how to discern the signs of aggression and bullying at home. They are expected to maintain consistent rules and disciplinary practices to deter their children from aggressive behavior. Parents are taught to identify even seemingly minor signs of bullying and aggression, such as damaged schoolbooks and cuts or bruises. These small signs can be indicative of victimization, and should be reported to teachers and staff during parent-school meetings. In addition, parents should keep a close eye on their child's friends and social activities, which will help teachers get a better idea of which students are involved.

Olweus (1991, 1995) reviewed the evidence on program effectiveness in a large sample of students from grades four to seven, following these students over a span of 2.5 years. Bullying decreased by at least 50 percent, and general antisocial behavior was markedly reduced. More broadly, the program had positive effects on the general school environment. Teachers reported more positive peer interactions, and better attitudes toward schoolwork. Although other reviews have demonstrated somewhat smaller effect sizes, the program has consistently demonstrated reductions in bullying behavior over the past two decades (Limber 2006; Olweus 2005). Moreover, these effects tend to get stronger with time (Olweus 2005), demonstrating significant dosage effects. While future work is needed to better investigate possible moderators and mediators of these effects (Limber 2006), this program remains one of the most effective for reducing aggressive and antisocial behavior in the literature.

### 8.5.2 Life Skills Training

Life skills training programs (LST) (Botvin, Eng, and Williams 1980; Botvin and Griffin 2004) seek to discourage drug use among early adolescents. Intervention sessions involve teaching adolescents self-management skills (goal-setting, problem-solving), social skills (ability to interact with others), and drug-related information (consequences and skills to reduce peer drug influences). Often these sessions occur in the school with teacher assistance, because schools provide a ready opportunity to sample several adolescents at the same time. With respect to its goals and methods, LST clearly mirrors some of the social skills programs mentioned earlier. However, LST includes "booster" sessions on these topics for an additional two years' time.

The LST programs have consistently demonstrated efficacy in reducing drug use in both small-scale and large-scale study implementations (for a review, see Botvin and Griffin 2004). For example, Botvin et al. (2001) report that intervention participants were less than half as likely to report binge drinking than control adolescents at both one- and two-year follow-ups, demonstrating the long-term effects of LST programs. Using the wealth of data on these programs, researchers have been able to identify a number of mediating variables that might partially account for the evidenced decreases in drug use (Botvin and Griffin 2004). Some possible mediators

include participants' attitudes toward drugs, their perceived norms of drug use, assertiveness, decision making, and refusal skills. It is worth noting that several of these are similar to those mentioned before, with respect to the short-term interventions.

### 8.5.3 Seattle Social Development Project

The Seattle Social Development Project (SSDP) is a school-based approach that extends into the family environment (Hawkins et al. 1992; Hawkins et al. 2007). The program posits that children can follow either a prosocial path, which serves as a protective buffer, or an antisocial path, which serves to promote delinquent and problem behaviors. The overarching goal of the program is to motivate youth toward the prosocial path, and away from the influence of deviant and delinquent peers.

The first stage of implementation occurs at the teacher level. Teachers are trained to implement more prosocial and cooperative activities in their classrooms. Emphasis is placed on providing students with opportunities to learn in small groups, and implementing consistent disciplinary and reward practices. Methods are specifically tailored to provide age-appropriate instruction for students from first to sixth grade. After appropriate training, teachers are told to integrate these practices into their daily curriculum, providing students with consistent doses of the intervention. Students then progress through the school years, receiving the preventive intervention for as many years as their school system allows. This allows for the long-term development of communication, social, and decision-making skills.

The second stage of intervention involves parent-training sessions. Again, these sessions are tailored to provide parents with information specific to their child's current stage of development. Early on, parents are taught appropriate disciplinary techniques, including child-monitoring skills. Later they learn methods for discouraging their child's drug use. Each year, parents are provided with the opportunity to take part in these training sessions, which are not particularly time consuming (only four to seven sessions per year).

The SSDP has demonstrated efficacy in addressing its primary program goals. Receiving two years of the intervention reduced aggressive and antisocial behavior among Caucasian boys compared to the control group (Hawkins, Von Cleve, and Catalano 1991). After receiving four years of treatment, intervention participants scored better on a number of family and school outcomes, including family management and communication, and school commitment and attachment (Hawkins et al. 1992). In addition, intervention students reported less initiation of delinquent and alcohol-related behaviors. Finally, studies have assessed whether these effects are lasting by sampling intervention participants at age 21 (Hawkins et al. 2005; Lonczak et al. 2002). Overall, full intervention participants performed better on several measures of general life outcomes (high school graduation, cur-

rent employment), mental health, crime, and sexual behavior (see Hawkins et al. [2007] for a review). Therefore, it appears that the intervention continued to lead to positive outcomes even into emerging adulthood. However, since the long-term effects of this intervention are sometimes small and nonsignificant (see e.g., Hawkins et al. 1999), further research is needed to investigate possible mediators and moderators of intervention efficacy.

## 8.6 Long-Term Negative and Inconclusive Interventions

Obviously a number of projects could be reviewed in our final category, since most long-term interventions can be considered as having “inconclusive” support. We therefore chose to mention a couple in hopes of sparking interest for future work. It is worth emphasizing that we are not saying these are *negative* programs, but rather that “the jury is still out” regarding their effectiveness.

### 8.6.1 Positive Youth Development

Positive youth development (PYD) programs counter the traditional approach of identifying “negatives” and addressing them. Instead, PYD programs posit that youth possess the potential for “good,” which should be nurtured by the community (Benson 2003; Lerner 2004; Lerner et al. 2005). The PYD programs focus on promoting social competence and connectedness, resilience, and the adoption of prosocial standards. To achieve these ends, PYD programs often work with youth throughout their development in multiple areas (family, school, and community). This movement is relatively recent, and thus these programs have had relatively fewer empirical tests. However, recent work does support the claim that PYD programs can decrease youth’s propensity to take part in delinquent activities.

Lerner and colleagues (Jelicic et al. 2007; Lerner et al. 2005) have investigated PYD using a longitudinal investigation of 4-H programs, which provide youth with opportunities to learn about science and farming using cooperative group activities (4-H 2009). Youth are able to participate in these programs from early childhood into adolescence. Jelicic et al. (2007) assessed 4-H participants as fifth and sixth graders on indicators of the five primary PYD goals (caring, character, connection, competence, and confidence), as well as adaptive and maladaptive outcomes. They demonstrate that youth higher on the PYD goals at fifth grade were less likely to take part in risk behaviors at sixth grade (delinquency and substance use). It thus appears that promoting PYD can decrease crime behaviors among youth.

While researchers are increasingly looking into PYD approaches (see Catalano et al. [2002] for a review), the 4-H study and the SSDP are two of the few PYD programs that have systematically assessed their efficacy in reducing problem behaviors. Given that the PYD movement has emphasized its distinction from past risk-prevention approaches, it is unsurprising that

most programs tend to focus on the positive (Schwartz et al. 2007). However, most of the PYD goals clearly resemble those mentioned before as detractors to crime and delinquency, such as social competence and cooperation. One, therefore, would predict that PYD approaches should similarly prove efficacious in reducing problem behaviors. To this end, Schwartz et al. (2007) suggest that future research on interventions need to integrate ideas from risk-protection and PYD approaches to provide the most thorough solutions to the problems of youth.

### 8.6.2 Prison-Based Interventions

A second set of interventions with inconclusive results focuses on rehabilitation programs within prison populations. While these intervention programs sometimes last less than six months, we classified these as long-term given that the length of imprisonment itself probably should be included when considering whether they decrease recidivism postrelease. A recent meta-analysis suggests that prison interventions can be effective in reducing prison misconduct (French and Gendreau 2006). Moreover, the interventions that proved effective in reducing misconduct also were shown to decrease levels of recidivism after release. Therefore, although imprisonment itself might be a poor deterrent, as noted earlier, there are ways to help decrease recidivism even within the prison environment.

In the meta-analysis, behavioral programs appeared to be most effective for reducing problem behavior (French and Gendreau 2006). It is worth noting that this category was rather inclusive in nature, containing approaches using behavioral, cognitive-behavioral, and social learning techniques. This was contrasted against “nonbehavioral” programs that included everything from group interventions to nutrition programs. Clearly, there is great heterogeneity in the types of interventions employed in prisons. Moreover, the meta-analysis indicated large levels of heterogeneity in the results of these programs, with some fairly strong outliers. This is one reason why we chose to consider the evidence on prison interventions as inconclusive, despite the positive effects on average for both behavioral and nonbehavioral programs. Another reason to classify this initial evidence as inconclusive is that several elements of the prison system impede the ability for rigorous evaluation of these programs. For one, levels of overcrowding differ dramatically across prisons, which can have profound effects on implementation efficacy. Therefore, interventions might work for some prisons and for some prisoners that fail to show effects in other contexts. Future research thus needs to conduct more thorough on-site evaluations, and focus on rigorous program implementation (French and Gendreau 2006).

### 8.6.3 Social Cognitive Skills Training

We end our review of long-term negative and inconclusive interventions by examining recent work on programs to develop interpersonal skills from



a social cognitive framework. Deviant youth have been shown to interpret social situations differently from “normal” youth. Aggressive youth are more likely to attribute others’ actions as signs of hostility (e.g., Dodge et al. 1990; MacBrayer, Milich, and Hundley 2003; Slaby and Guerra 1988). Moreover, hostile and aggressive individuals appear to attend more to aggressive cues and actions than nonaggressive individuals (Dodge et al. 1997; Zelli, Huesmann, and Cervone 1995). To address these issues, social cognitive interventions target the youth’s social information processing skills on several levels. These interventions intend to lead youth toward (a) better attention to and interpretation of social cues, (b) more adaptive action goals and scripts, and (c) better activation and retrieval of these scripts, which in turn promotes more adaptive responses to social situations (see e.g., Crick and Dodge 1994; Huesmann 1998). These efforts often take place over multiple years, and incorporate teachers, counselors, and parents in the intervention process.

Evidence for these programs, however, can be viewed as, at best, equivocal. They can be successful in targeting their proximal outcomes, such as social cognitive skills (for a meta-analysis, see Beelmann, Pfingsten, and Lösel [1994]). There is much less support for the long-term nature of these effects, or that these interventions in fact decrease problem behaviors. One study reported moderate, but significant, decreases in conduct problems between the intervention and control groups (Conduct Problems Prevention Research Group 2002). However, not all indicators of conduct behaviors showed significant differences, and even some indicators of social cognitive skills failed to reach significance. More recent work paints an even less promising picture. A multisite study evaluation was recently conducted for the GREAT program (Guiding Responsibility and Expectations in Adolescents Today and Tomorrow) (Meyer et al. 2004; Orpinas, Horne, and Multisite Violence Prevention Program 2004; Smith et al. 2004), which demonstrated that social cognitive interventions might instead have detrimental effects (Multisite Violence Prevention Project 2009). Indeed, youth who received the universal intervention (participants were not selected based on risk) demonstrated significant *increases* in aggression and the endorsement of norms supporting aggression.

Generally, two points are worth noting with respect to social cognitive skills interventions. First, these interventions appear more effective for high-risk children, and thus should not be universally applied. While the program had negative effects when applied universally, the effectiveness of the GREAT program was moderated by the child’s level of risk (Multisite Violence Prevention Project 2008, 2009). Children appeared to benefit more (or in some cases, be less negatively affected) when they were classified as having multiple risk factors. However, even in these studies, often only those participants reporting with at least half of the examined risk factors actually demonstrated positive effects. Second, such programs appear to be cost-effective only for the highest-risk group (Foster and Jones 2007),

given that the cost per child can exceed \$50,000 and, more importantly, that they only seem to decrease criminal activity for the highest-risk youth. Perhaps the most optimistic appraisal of these interventions is that they are burdened by the idiosyncrasy and nuance of their effects. These programs only appear to help a select group of youth, and at a particularly prohibitive cost. Indeed, this idiosyncrasy is underscored by research in Scotland that found much more variation between different schools within a treatment category than between schools from different treatment categories (Sharp and Davids 2003).

## 8.7 Summary and Conclusion

In this review, we examined the initial work on interventions for antisocial behavior that addressed the problem by focusing on factors other than cognitive ability. As is evident throughout, a number of these programs show promise in their ability to reduce delinquent actions. A few common themes across this review are worth noting. First, with respect to intervention duration, the conclusions are more ambiguous than portrayed in the literature. It does appear that single-dose interventions are unlikely to demonstrate strong results. However, short-term interventions can demonstrate significant effects, and often there is more evidence in favor of their efficacy than currently available for long-term programs. Therefore, conclusions about duration are tempered by what one means by “short” and “long.” Our review does contradict a strict interpretation of duration benefits, insofar that longer is not always better. We would hasten to add that extremely short-term approaches seem ineffective. Possibly the best message to take home regarding duration is that it is not as clear a predictor of efficacy as it has been portrayed at times in the literature.

Second, in order to reduce delinquency, interventions in any domain could emphasize rigorous and consistent implementation. For example, with respect to school-based programs, reducing delinquency requires teachers and parents to set forth clear directions and rules for youth, and those who break these rules must be disciplined in a consistent fashion. Several programs reviewed sought to train teachers and parents to better identify and respond to youth problems. Therefore, it appears that one mark of an effective intervention is whether it is rigorously implemented. Indeed, meta-analyses show that implementation integrity is a significant predictor of program efficacy (Lipsey and Wilson 1998), and even suggest that the best advice for schools is to choose the program that they have the most faith that they can implement (Wilson and Lipsey 2007).

Third, to maximize the chance of promoting cognitive development, interventions could incorporate the family environment in some capacity. This is evident both with respect to the short-term effective programs (e.g., functional family therapy and parent management training), and the long-

term ones (e.g., the Olweus program and the SSDP). The family system is the most proximal to the youth (Bronfenbrenner 1979), and thus it is unsurprising that programs are most effective when they target the family. Family-based programs also tend to be among those deemed most effective in meta-analyses (Lipsey 2009; Lipsey and Wilson 1998).

Fourth, as made evident by programs emphasizing social skills, interventions that are most likely to result in reduced criminal activity would motivate youth to develop more effective strategies for dealing with social situations. Youth offenders often are less adept at interpreting social situations (Dodge et al. 2003; Gouze 1987), which can serve as a catalyst for deviant activities. Social skills training thus can help youth not only by teaching them appropriate social schemata for future use, but also by providing youth the opportunity to practice these skills. Through practice, such skills can become routinized and readily accessible to the youth for use in future interactions. Given the lack of efficacy for social cognitive interventions, this points to a potential significant insight. Learning interpersonal rituals that are routinized and thus no longer “cognitive” is a very effective means of reducing delinquent behavior. Thus, cultural rituals for “proper” or polite interpersonal behavior, which is often the focus of life skills or interpersonal training, may provide simple, but effective ways of decreasing delinquency.

We again note the correspondence between the cost-benefit comparisons provided by Drake, Aos, and Miller (2009) and our review. It is worth further to note that they found little relation between the percent change in crime outcomes and the cost of the program. For example, in their review, functional family therapy (FFT) demonstrated the greatest reduction in crime outcomes, yet was only around the median of reviewed interventions with respect to costs. To compare its effects to a therapy program the reader may better know, cognitive-behavioral treatment (CBT), this reduction was over six times greater than that evidenced by CBT, which focuses instead on correcting aberrant emotions and behaviors by attempting to retrain the way individuals think and their behavior in specific situations. On the other hand, programs like boot camps and “Scared Straight” can be implemented with little to no cost, yet fail to have any beneficial effect on crime. Moreover, this cost-benefit comparison accounted for the methodological rigor of the studies, by both attenuating effect sizes for studies with less than ideal designs (i.e., not having a true control group and randomized design) and eliminating all studies that failed to meet a set methodological rigor. Therefore, even though we sought to provide a broader review of the intervention literature, one comes to the same conclusions even when assessing interventions using cost-benefit analyses based on only rigorous program evaluations.

The gestalt one takes from the effective interventions is that they either affect physiological systems or entail a high degree of immersion, which we would differentiate from dose or length of intervention. By immersion, we mean that a significant portion of the juvenile’s social structures are all dedi-

cated to changing or limiting the behavior of the juvenile. So, for example, family appears to be an effective vector for intervention, presumably because family constitutes one of the most important, multifaceted structures in the lives of children and juveniles. Similarly, interventions like the Olweus Bullying program act on all of the major social structures that children face, such as school, peers, and family, and are highly effective. In turn, physiological interventions, though apparently nonimmersive, may mimic some of the effects of pervasive social control on psychological outcomes. One possibility is that the serotonergic system is at the root of the psychological systems responsible for the variety of behaviors associated with delinquency and criminality.

Moreover, this gestalt coincides with theories of developmental psychopathology, which attempt to describe the developmental trajectories of psychological and skill deficits starting early in youth (Cummings, Davies, and Campbell 2000). In line with our review, these developmental pathways are complex and incorporate factors across different domains (family, social, environmental, biological). Moreover, an individual is never destined for adaptive or maladaptive development (Sroufe 1997), suggesting that interventions can be successful even for children at the highest risk. Indeed, “resilience” can be conceptualized similarly to recent views on personality traits (e.g., Roberts 2009), insofar that while resilience demonstrates continuity over time, it is not static and unchanging (Luthar 1991, 1995; Luthar, Doernberger, and Zigler 1993). This view of development thus argues against focusing on any single predictor (e.g., cognitive ability), and provides rationale why immersive programs may best benefit youth as they address a wider range of social and environmental factors that put youth at risk for criminal activity.

Interestingly, pervasive and consistent social environments have been hypothesized to be the most likely types of environments to affect change in personality traits (Roberts and Jackson 2008). Ironically, despite the fact that personality traits are clear risk factors for criminal activities, the interventions we reviewed seldom assessed changes in personality, presumably because researchers often make the mistake that they are unchangeable (Roberts and Caspi 2001). That being said, many of the interventions detailed earlier may be working exactly because they are facilitating fundamental changes in the personalities of the children and adolescents who are participating in the interventions. Changing personality traits, as opposed to more “changeable” constructs, such as very specific thoughts and behaviors, may be a more effective intervention because of the simple fact that people take their personalities with them across situations.

For example, several of the desired intervention outcomes can be readily designated as facets of conscientiousness (Roberts et al. 2004). Conscientiousness is a family of traits marked by subfacets such as industriousness, impulse control, deciveness, orderliness, responsibility, and conventionality;

the latter focusing on following rules and norms. Any decrease in crime and delinquency implicitly suggests that the delinquent is demonstrating better adherence to the rules of conventions of society, as well as improved impulse control. Even having to adhere to intervention guidelines should motivate one to be more reliable and punctual, and to follow the order and conventions of the specific intervention. Second, several programs emphasized problem-solving and decision-making skills, often in social or family contexts, which are direct initiatives to promote decisiveness. Third, to the extent that job training or educational initiatives work, these types of programs appear to be directly designed to promote industriousness. Accordingly, developing interventions for conscientiousness should serve as a primary goal for future research.

It is also worth noting that some programs might also serve to promote greater agreeableness. Agreeable individuals are marked by their cooperation and trustfulness (e.g., McCrae and Costa 1992). It thus is unsurprising that several of the most effective programs were those that taught youth better social and life skills. In addition, the more effective school-based programs were those able to motivate agreeableness at the school level (e.g., general school ethos and affection). Moreover, it is clear that the family context would be a primary target for interventions to increase agreeableness, because temperament quality and emotional stability early in childhood might serve as antecedents for the display of agreeableness later in life (e.g., Graziano and Eisenberg 1997). It even appears that the recent PYD movement posits the promotion of agreeable behavior as a primary objective. Indeed, three of the five indicators of PYD (Lerner et al. 2005)—character, connection, and caring/compassion—would be similarly indicative of an agreeable individual. Since agreeableness counterindicates delinquency (Miller et al. 2003), we believe that PYD programs have promise for decreasing rates of crime and delinquency among youth, even though they currently have relatively less empirical support.

Of course, there are very little direct data to support the idea that these interventions are affecting change in personality. In fact, despite focusing so strongly on bullies, even the Olweus Bullying program has failed to track whether the personality of bullies changes over time as a result of intervention. However, there are some indirect data to support this inference. First, personality traits do change and often change at ages typically not entertained, such as middle age (Roberts, Walton and Viechtbauer 2006). Moreover, the changes in personality traits found in young adulthood and middle age are often correlated with social environmental factors associated with overcoming criminal activities, such as stable marriages (Robins, Caspi, and Moffitt 2002; Roberts and Bogg 2004), and successful occupational experiences (Roberts, Caspi, and Moffitt 2003). These associations are surprisingly similar to the theories of social control that propose that experiences in work and marriage can lead to a desistance from a life of crime (Sampson and Laub 1990). Finally, there is a nascent literature on

the changeability of personality through direct therapeutic intervention. Several studies have shown that personality traits change when individuals successfully complete some form of therapy for disorders such as depression (Piedmont and Ciarrocchi 1999; De Fruyt et al. 2006). More recently it was shown that a mindfulness intervention for doctors also resulted in personality trait change, especially in the domains of conscientiousness and neuroticism (Krasner et al. 2009). Finally, coming full circle with the nutrition interventions that appear to be affecting serotonergic functioning, a recent study showed that taking serotonin reuptake inhibitors resulted in personality trait change and that the reductions seen in depression were largely a result of this change (Tang et al. 2009).

We therefore suggest that several of the programs reviewed here might demonstrate positive effects by virtue of their ability to change personality traits. To this end, one clear direction for research is to design and implement interventions for promoting more adaptive personality traits, such as conscientiousness, agreeableness, social self-confidence, and emotional stability. We nominate these personality dimensions because they have been previously designated as indicators of greater maturity (Hogan and Roberts 2004), a construct seemingly antagonistic to delinquent and unlawful action.

### 8.7.1 Conclusion

We wish to end on the positives rather than the negatives. Throughout this review, it is clear that youth are not condemned to a life of crime. Instead this work demonstrates the multifinality inherent in this population. Accordingly, one must not characterize these youth as “hopeless,” which in turn leads one to avoid intervening. Moreover, in our review, we hope to have debunked two myths regarding how to intervene. First, researchers need not be overwhelmed by the perceived demands of implementing intervention programs. Our review demonstrates that relatively short-term and easy-to-implement programs can demonstrate significant effects (e.g., health-based interventions). Second, noncognitive interventions can have as strong, if not stronger, effects than programs targeting IQ or the environment. Several factors influence the development of delinquency, and accordingly, a single-minded focus on intelligence seems misguided. While Descartes famously decreed, “I think, therefore I am,” intervention researchers should take note that we are more than what we think.

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