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A social-cognitive information-processing model for school-based aggression reduction and prevention programs: Issues for research and practice

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Abstract

Student aggression in schools continues to be a problem. School-based programs are a critical part of the solution. In this article we review research on the development of aggressive behavior within a social-cognitive information-processing (SCIP) framework. Huesmann (1998) presented a “unified” SCIP model in an attempt to integrate extant models. This model focuses on individuals’ (a) attention to and interpretation of situational cues; (b) search for and retrieval of scripts for behavior; (c) script evaluation based on beliefs about aggression, outcome expectancies, and self-efficacy for aggressing or inhibiting aggression; and (d) interpretation of environmental responses to their behavior. We highlight components of best practice school programs that address these steps. Limitations of the SCIP framework are discussed as directions for future research. Applied recommendations based on a unified SCIP model are offered.

Key words: Aggression, school programs, social-cognitive information-processing

All forms of aggression in schools tax the resources of school personnel and can result in serious consequences for student victims and perpetrators. Student aggression in schools is associated with increases in school avoidance and traumalike symptoms in those victimized by it or witness to it (e.g., Singer, Anglin, Song, & Lunghofer, 1995) and is thought to lead to school failure and delinquency in those who perpetrate it (e.g., Hinshaw, 1992; Tolan, Gorman-Smith, & Loeber, 2000). Most important for educators, student aggression in schools detracts from the academic environment by interfering with both teaching and learning (e.g., Boxer, Danner, Dubow, Musher-Eizenman, & Heretick, 2002).

In contrast to recent sensationalized high-impact incidents of school violence (e.g., shootings; see Verlinden, Hersen, & Thomas, 2000), lower impact aggressive acts such as fighting, taunting, ostracizing, and bullying have posed problems in schools for some time. Based on a survey of nationally representative samples of 12- to 19-year-olds, Chandler, Chapman, Rand, and Taylor (1998) discovered that over 14% of

students reported having experienced property or violent victimization at school, 28% reported street gang presence at school, and 13% reported knowing a student who brought a gun to school. In a review of four national survey reports, Kingery, Coggeshall, and Alford (1998) noted prevalence rates as high as 29% for secondary school students who had been involved in physical fights in the past year.

School-based programs are a necessary part of the solution to the problem of youth aggression (Farrell, Meyer, Kung, & Sullivan, 2001). Hunter, Elias, and Norris (2001) suggested that such programs should follow from a solid theoretical perspective. Contemporary research on aggressive behavior development supports the design of programs using a social-cognitive information-processing (SCIP) framework. Crick and Dodge (1994) and Huesmann (1988) reviewed evidence that aggressive children exhibit an “aggression-supporting” cognitive information-processing style (e.g., aggression-related beliefs and biases). These researchers developed SCIP models to explain why children habitually behave aggressively. Huesmann (1998) advanced a unified framework for aggression, integrating the two models. Huesmann and his colleagues have emphasized beliefs about aggression and the processes by which aggressive scripts (internalized guides for behavior) are learned (e.g., through exposure to violence) and maintained (e.g., through cognitive rehearsal). Dodge and his colleagues have focused more on children’s hostile biases and decision-making skills in social-conflict situations

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and the effects of peer responses (e.g., rejection) on maintaining these cognitions. Both models center on how SCIP factors mediate and thus maintain the expression of aggressive behavior over time, however.

The Centers for Disease Control and Prevention (CDC) recently identified social-cognitive approaches as “best practices” for violence prevention (Thornton, Craft, Dahlberg, Lynch, & Baer, 2000). A social-cognitive orientation to intervention emphasizes learning, thinking, and reasoning. Such an approach meshes well with the basic educational agenda of schools as institutes promoting knowledge acquisition and cognitive development. It should also be noted that schools are not equipped to administer psychiatric or intensive psychotherapeutic interventions designed to target other risk factors for aggression such as mental illness or early developmental trauma. Thus, schools appear to be the appropriate context for implementing aggression reduction and prevention programs aimed at modifying SCIP functions and skills.

Although researchers and practitioners have implemented and evaluated social-cognitive approaches to aggression (e.g., problem-solving skills training; Shure, 2001), programming based on a *unified* SCIP framework (i.e., one that integrates the models of Crick & Dodge [1994] and Huesmann [1988]) has not yet been subject to empirical investigation. This unified model has significant utility for informing a new generation of school-based interventions. The purposes of the current analysis are: (a) to review the development of aggression from an SCIP perspective; (b) to review aspects of the SCIP model currently employed in “best practice” programs (as determined by the CDC; Thornton et al., 2000); (c) to examine critically the limitations of a *unified* SCIP approach to aggression reduction and prevention, highlighting the need for more research in specific areas; and (d) to offer practical recommendations based on the SCIP framework for program developers.

The Development of Aggressive Behavior

Risk Factors

Aggression is multiply determined (Eron, 1994). A staggering number of biopsychosocial risk factors for the development of aggressive behavior have been identified. These risk factors are typically viewed as the “causes” of aggressive behavior, and include: biological predispositions (Stoff & Cairns, 1996), exposure to domestic and media violence (Huesmann & Miller, 1994; Spaccarelli, Coatsworth, & Bowden, 1995), socioeconomic factors (Eron, Guerra, & Huesmann, 1997), psychological disorder (Monahan, 1997), harsh or coercive parenting practices (Dodge, Pettit, & Bates, 1997; Patterson, 1982), and peer rejection or victimization (Schwartz, 2000), among others. Aggression also can result from situational factors such as negative emotional arousal (Berkowitz, 1998), substance use (Taylor & Hulsizer, 1998),

and provocation (Farrell, Ampy, & Meyer, 1998). All of these factors can interact; for example, a child with a difficult temperament might elicit harsh treatment from parents or peers.

There also is much evidence that aggressive behavior is relatively stable over time and that early aggression is the strongest predictor of later aggression (e.g., Farrington, 1982; Huesmann, Eron, Lefkowitz, & Walder, 1984; Moffitt, 1990). Current approaches to studying aggressive behavior operate from the perspective that aggression persists over time in part through *social-cognitive mediation*. This does *not* mean that aggressive behavior is *caused* by certain cognitions. Rather, environmental “socializers” (e.g., parenting practices), biological predispositions (e.g., difficult temperament), and situational “instigators” (e.g., provocation) interact to activate a cognitive style involving a specific set of social cognitions, leading an individual to exhibit a stable pattern of aggressive behavior (Huesmann, 1998). Thus, the SCIP model represents the person-level cognitive processing component (e.g., how the child attends to, interprets, evaluates, and chooses to respond to the environment) of a larger cognitive-developmental-ecological framework for understanding the complex interplay of factors influencing aggression (e.g., Conduct Problems Prevention Research Group, 1999a; Metropolitan Area Child Study Research Group, 2002; Reid, Eddy, Fetrow, & Stoolmiller, 1999).

The Social-Cognitive Information-Processing Perspective on Aggression

Eron (1994) traced the development of theories of aggression from early frustration/drive models (e.g., Dollard, Doob, Miller, Mowrer, & Sears, 1939), to early social learning models (e.g., Bandura, 1973), to the current social-cognitive approaches (e.g., Bandura, 1986; Berkowitz, 1998) that stress interactions between external (e.g., parenting, situational cues) and internal (e.g., beliefs, self-efficacy expectations) factors as determinants of behavior. Researchers (e.g., Crane-Ross, Tisak, & Tisak, 1998; Dodge & Newman, 1981; Dubow & Reid, 1994; Erdley & Asher, 1996; Huesmann & Guerra, 1997; Slaby & Guerra, 1988) have identified several social-cognitive variables that influence an individual's reactions to any given social conflict situation, for example: preexisting level of emotional arousal on entering the situation, attention to various aspects of the situation (e.g., facial expressions of the other individual), perceiving the other as having hostile intentions, believing that responding to peer provocation with aggression is appropriate, repertoire of aggressive versus prosocial scripts that the individual has internalized, believing that aggression will result in the desired outcome, and believing that one is actually able to aggress or resist aggressing against another individual.

Huesmann (1988) elaborated a cognitive information-processing model of aggression, primarily to explain earlier empirical findings demonstrating the maintenance of aggressive behavior from childhood through adulthood. This four-

step decision-making model includes the following sequence of processes that children use in a social problem situation: (1) evaluate environmental cues, (2) search memory for a script to guide behavior, (3) evaluate the generated script, and (4) behave according to the script. Huesmann (1988) relied heavily on cognitive theories of behavior and the concept of *scripts* (i.e., “programmed” guides to behavior, stored in memory) in explaining the maintenance of aggressive responding.

Crick and Dodge (1994) proposed a social information-processing model of aggression, focusing on findings showing striking differences in social cognition between aggressive and nonaggressive children. This six-step model includes the following sequence of processes that children use in a social problem situation: (1) encode, or represent in memory, social cues; (2) interpret the social cues; (3) clarify desired goals; (4) access potential responses; (5) evaluate and choose a response; and (6) enact the response. Crick and Dodge (1994) emphasized proximal control mechanisms of behavior, such as how a child attributes intent to another’s behavior (e.g., hostile versus benign) and the child’s goals in the situation.

Huesmann (1998) proposed a “unified” model as an attempt to integrate these two extant SCIP models. Both models attend to the importance of factors such as emotional arousal and early learning histories, and both center around the mediational role of mental mechanisms in behavior. Huesmann (1998) attempted to incorporate key features of both models in elaborating the social-cognitive process leading to aggressive responses. His unified model emphasizes four steps in the process of enacting an aggressive response that should be most predictive of behavior in a social-conflict situation. From an intervention perspective, these four points also might be the most amenable to modification. Figure 1 illustrates this model. On the far-left side of the figure are the underlying processes contributing to each of the four steps.

1. *Attention to and interpretation of situational cues.* At the outset of a peer-conflict situation, the child must first *attend to and evaluate cues* (i.e., determine the salient aspects of the situation). This step is a key component of the SCIP functions proposed and researched by Dodge and his colleagues. The nature and intensity of the child’s preexisting and reactive internal arousal (e.g., anger, fear) have an important effect on attentional processes. Aggressive children are more likely than nonaggressive children to attend selectively to aggressive cues in their environment (Gouze, 1987) and to display an attributional bias whereby they perceive hostile intent in others when exposed to an ambiguous provocation (Dodge & Frame, 1982). These biases are more likely to emerge during high emotional arousal (Dodge & Somberg, 1987). Aggressive children are also likely to attend to fewer cues overall than nonaggressive children (Dodge & Newman, 1981), to focus primarily on those cues triggering aggressive scripts, and to display deficits in empathy (Björkqvist, Österman, & Kaukiainen, 2000), all of which

might lead them to mislabel or ignore emotional cues in others.

2. *Script search and retrieval.* Depending on the cues to which the child has attended (e.g., anger, gang colors) and his or her interpretations of those cues (e.g., hostile intent attribution), the child then *searches for and retrieves relevant scripts*. This is a critical step emphasized by Huesmann and his colleagues. Scripts are mental representations that direct behavior by “laying out the sequence of events that one believes are likely to happen and the behaviors that one believes are possible or appropriate for a particular situation” (Huesmann, 1998, p. 80). Scripts function in the context of automatic cognitive processing. That is, once a script for behavior has been learned, it can be accessed and activated without much effortful thought. Aggressive scripts are derived from observed (e.g., parental conflict, violent television programs and video games) and direct (e.g., peer approval for fighting) learning experiences. Further, scripts are maintained independently of actual behavior through cognitive rehearsal. This rehearsal contributes to the likelihood that aggressive scripts will remain available. For example, Eron (2001) describes studies demonstrating that aggressive children tend to have aggressive fantasies. Research has indeed shown that compared to nonaggressive children, aggressive children are more likely to generate aggressive strategies in response to hypothetical provocation situations (e.g., Dubow & Reid, 1994). This is likely the result of two factors: (a) through the cue attention and interpretation process, aggressive children are more likely to have aggressive scripts activated; and (b) through their learning history, they might simply have fewer prosocial scripts available as alternatives to aggression (Huesmann, 1998), in addition to a high number of aggressive scripts (Eron, 2001).

3. *Script evaluation.* Once a script is retrieved, the child *evaluates it for acceptability* along three critical criteria: “Is it appropriate to the situation?” (*beliefs*), “Will it achieve the desired outcome?” (*outcome expectancy*), and “Am I able to carry it out?” (*self-efficacy*). Aggression-supporting beliefs (e.g., “If I back down from a fight, everyone will think I am a coward”) are linked to aggressive behavior (Slaby & Guerra, 1988) and children who believe that aggression is the “right” thing to do in a situation are more likely to be aggressive than their peers (e.g., Crane-Ross et al., 1998; Huesmann & Guerra, 1997). Regarding outcome expectancies, children who anticipate desired outcomes from aggression (e.g., successfully cutting in line for a drink of water) are more likely to be aggressive than their peers (e.g., Egan, Monson, & Perry, 1998). Outcome expectancies are thus linked to social goal clarification and selection (i.e., “What do I want to happen?”), a key aspect of Crick and Dodge’s (1994) model. With respect to self-efficacy, Erdley and Asher (1996) found that when presented with a hypothetical provocation situation, aggressive children had higher self-efficacy for aggressive responses and lower self-efficacy for prosocial responses than did nonaggressive children.

4. Behavioral response and evaluation of consequences.

The child *enacts* the chosen scripted response and *evaluates the environment's responses to the behavior*. Huesmann (1998) notes that this is a critical step in explaining how aggressive scripts might be maintained even in the face of strong sanctions, for example, the "zero tolerance" policy for aggression. If an aggressive student interprets the punishment for his aggression as the result of a principal's personality or that "others have it out for me," rather than the logical consequence of the behavior, it is less likely that the punishment will modify the behavior. Aggressive children have been shown to value the rewards of aggressive responding (such as controlling a victim), and devalue the punitive consequences (such as victim suffering), more than nonaggressive children (Boldizar, Perry, & Perry, 1989). Aggressive children also tend to associate with one another, thus providing social reinforcement for each other's behavior (e.g., Poulin & Boivin, 2000).

Let us consider how the SCIP framework can be applied to an incident of student aggression. Imagine that a student who has just received a poor exam grade (preexisting emotional arousal) is now changing classes. The student is accidentally bumped into by a peer (social-conflict situation), immediately becomes aware of negative arousal (*attends to cue*), and notes that the other student neglected to apologize for the incident (*attends to cue*). The student who was struck feels anger (*interprets cue*), and views the event as intentional, hostile, and disrespectful (*interprets cue*). Deciding what to do, the student recalls an event in which respect was maintained by answering a hostile provocation with an aggressive response (*searches for and retrieves script*). Because the student has observed, experienced, and thought about this script many times, it is recalled quickly and automatically and no alternatives come to mind (*searches for and retrieves script*). In the activated script, the aggressive response results in the infliction of pain on the provocateur and the maintenance of respect (*evaluates script using outcome expectancy*). Because the student believes it is acceptable to hit someone, especially when angry and provoked (*evaluates script using normative beliefs*), and has successfully done so in the past (*evaluates script using self-efficacy*), the student chooses to lash out (*enacts selected script*). Later, although receiving an in-school suspension, the student is pleased to be congratulated by friends for not backing down (*interprets environmental response*).

Social-cognitive information processes are believed to *mediate* the relation between environmental, temperamental, and situational risk factors, and actual aggression. Although much of the research conducted illuminating various aspects of the SCIP framework has been correlational in nature, evi-

dence from longitudinal and experimental studies has been compelling. For example, Huesmann and Eron (1986) have demonstrated that the relation between violence exposure and aggression is mediated *over time* by aggressive fantasies. Further, experimental intervention studies with elementary school children have shown that altering specific aggression-supporting social cognitions *leads to* reductions in aggression compared to no-treatment control groups (Hudley & Graham, 1993; Huesmann, Eron, Klein, Brice, & Fisher, 1983). Although there have been no tests of the unified SCIP model recently proposed by Huesmann (1998) with regard to intervention, many programs relying on components of SCIP skills have been successful.

Current SCIP Approaches to Reducing and Preventing Aggressive Behavior

School-based programs have used social-cognitive approaches for quite some time (e.g., Lochman, Dunn, & Klimes-Dugan, 1993; Shure, 2001), but many programs target a limited number of social-cognitive variables and generally do not address simultaneously the four key SCIP processes elaborated by Huesmann (1998). Toward the goal of deriving recommendations for schools based on the unified SCIP model, it is instructive to examine the ways in which current programs address social-cognitive factors. Broad reviews of school-based aggression reduction and prevention programs have already been offered (e.g., Howard, Flora, & Griffin, 1999; Larson, 1994). This section is intended to illustrate specific applications of the SCIP model in current best-practice programs as designated in a guide published by the Centers for Disease Control and Prevention (Thornton et al., 2000). These programs were identified through interviews with researchers and practitioners in the field, a review of the most current scientific literature available, and empirical findings demonstrating program effectiveness (Thornton et al., 2000). Although a review of program evaluation results is beyond the scope of this analysis, school-based aggression-reduction programs generally have yielded modest to moderate positive effects. In reports of programs published between 1993 and 1997, Howard et al. (1999) found that programs targeting elementary school students were more effective than those targeting older students, and programs intervening in the whole school ecology rather than solely in the classroom were most successful. Moderate positive effects have more recently been reported by FAST Track ("Families and Schools Together"; Conduct Problems Prevention Research Group, 1999a, 1999b). This section focuses on best-practice *school-based* programming with regard to aspects of the SCIP model.

Figure 1. An applied social-cognitive information-processing model for reducing and preventing school aggression, following Huesmann (1998).

Cue Attention and Interpretation

Based on our review of programs, the right side of Figure 1 presents methods that can be used to train the social-cognitive information-processing components of each step. The model suggests that program components addressing cue attention and interpretation should teach children a variety of skills: recognizing the range of internal and external "triggers" (cues) that provoke different kinds of arousal in self and others, recognizing and labeling arousal appropriately, seeking more information in an ambiguous situation to make an informed judgment about what happened, and interpreting social situations more accurately.

One way to assist children in developing a better understanding of their own "triggers" is to train them to be more empathic with regard to others' emotions. The Second Step program (Frey, Hirschstein, & Guzzo, 2000) offers instruction on empathy beginning as early as preschool. According to Frey et al. (2000), Second Step empathy lessons direct children to learn and consider the verbal, physical, and situational cues for six "basic emotions": happiness, sadness, anger, surprise, fear, and disgust. These lessons also encourage children to think about how people can have different feelings about similar events and how emotions can change over time. In the Promoting Alternative Thinking Strategies (PATHS) curriculum, implemented as a part of Project FAST Track (Conduct Problems Prevention Research Group, 1999a, 1999b), children use a technique called "Feeling Faces." After the introduction of new emotion concepts, children draw personalized representations of those affects. They are then eventually able to refer to their own drawings for the purpose of emotional communication throughout the school day.

Skills for interpreting the behavior of others also can be used during the process of attribution—determining the intentions and causes of another's behavior. Hudley and colleagues (Hudley, Britsch, Wakefield, Smith, Demorat, & Cho, 1998; Hudley & Graham, 1993) designed a program for late elementary school children (grades 3–6) targeting specifically the attributions made in a social situation to reduce aggressive responding. In the 12-session BrainPower Program (Hudley et al., 1998), participants are given instruction on different ways to interpret social situations. The program is divided into three components: (1) enhancing intention detection (i.e., searching for and categorizing different physical, verbal, and behavioral cues), (2) increasing the attribution of negative outcomes to accidental causes, and (3) linking nonaggressive behavioral responses to ambiguously caused negative outcomes. For example, to illustrate the differences among prosocial, accidental, hostile, and ambiguous intent, participants produce videotaped enactments of each. Much of the program consists of presenting participants with a variety of provocation situations, allowing them to role-play these situations and encouraging "brainstorming" about the different reasons that the provocation might have occurred.

Script Search and Retrieval

As the SCIP model suggests, improvement in cue attention and interpretation skills must be linked to the retrieval of prosocial scripts in conflict situations. Program components addressing the script search and retrieval step of the SCIP model would therefore help children by providing them with direct exposure to and instruction on a variety of prosocial skills, associating aggressive cues with nonaggressive responses, encouraging them to use alternative thinking strategies when solving interpersonal problems, and promoting the generalization of prosocial scripts to all school settings.

Most programs expose participants to and train them to use prosocial behavioral responses through role-plays and demonstrations. Some programs use videotaped presentations of children and adolescents resolving conflicts through nonaggressive means as a way to enhance exposure to prosocial models. Second Step (Frey et al., 2000) and Positive Adolescent Choices Training (Yung & Hammond, 1998) use age- and culture-specific videotaped instruction in anger-management and aggression-reduction techniques. Videotapes thus can provide developmentally and culturally appropriate models for program participants.

In order for programs to enhance script search and retrieval so that nonaggressive responses are chosen, activities must associate aggressive cues (both internal and external) with nonaggressive scripts. This is accomplished in the Anger Coping Program (Lochman et al., 1993; Lochman, Lampron, Gemmer, & Harris, 1987) during one phase of a "taunting game." In the game, participants practice ignoring skills to "stay cool" while they are verbally taunted by other group members.¹ Children must attempt to remember a set of 10 numbers, then stack a set of dominoes one-handed while being taunted for 5 seconds each time. This activity therefore pairs aggressive cues (i.e., verbal taunts and any resulting arousal) with nonaggressive scripts (i.e., focusing on an unrelated cognitive task).

Although children might learn a variety of nonaggressive scripts, and come to associate them with formerly aggressive internal and external cues, they will still be less likely to access those scripts if they are unable to recall them in the presence of aggressive cues. Engaging in alternative thinking increases the chances that nonaggressive scripts will be ac-

¹ Lochman et al. (1987) suggested that participants in this activity should be explicitly reminded to avoid vulgarity and racial slurs, and that facilitators should ensure that there is sufficient physical distance among group members. It is likely that children and adolescents engaged in an activity like this will have some difficulty in tempering their verbal taunts. Our own experiences conducting anger-management and aggression-reduction programs with adolescents indicated to us that adolescents are very willing to provoke one another. One caveat inheres in this kind of activity, however. Within the SCIP framework, encouraging program participants to incite anger and provoke aggression in one another can run counter to the overarching goal of fostering prosocial and nonaggressive behaviors. Program facilitators adopting this approach should be extremely careful to explain the purpose of this activity to their participants, and monitor participant behavior to maintain safety.

cessed. Alternative thinking is typically tapped through "brainstorming" activities in which facilitators challenge, encourage, and cajole children and adolescents to generate as many behavioral options and strategies as they can for a selected situation. For example, in the Anger Coping Program (Lochman et al., 1987), participants are asked to describe situations they had over the week prior in which they became angry. The group is then asked to list all the possible choices that could have been made in each situation.

The script-search-and-retrieval step is also supported by programming aimed at generalizing skills beyond the classroom setting. Some programs employ unique strategies to accomplish this. The PATHS program developers (Conduct Problems Prevention Research Group, 1999b) worked in consultation with school staff to expand the PATHS program to the whole school environment. Creative efforts resulted in activities used on a school-by-school basis, including the placement of PATHS posters in halls and painting the PATHS problem-solving stoplights (i.e., red = "Stop—Calm Down," yellow = "Go Slow—Think," and green = "Go—Try My Plan") on playgrounds. These aspects of PATHS contribute to the likelihood that the behaviors learned during classroom programming will be recalled in other school settings.

The issue of generalization is further underscored by the notion of automatic versus controlled processing. As students learn new scripts for handling social conflict and negative arousal, at first they must be trained to engage in effortful, controlled cognitive processing when searching for ways to handle problematic situations. This would be the case particularly if such situations occur fairly routinely, as in name-calling during athletic activities or physical jostling in hallways. According to Huesmann (1998), highly familiar situations are more likely to activate automatic processing for script search and retrieval. It is therefore important that students are provided with frequent exposure to nonaggressive scripts as well as opportunities for rehearsing such scripts outside of any focused instructional experiences. For example, concepts first taught by classroom teachers could be reviewed and reinforced in less structured (and thus potentially more problematic) settings by playground aides or physical education teachers.

Script Evaluation

Once multiple scripts are retrieved, children need to evaluate them to choose the one they believe would be most acceptable for them to enact. Program components addressing the script-evaluation step would assist children by encouraging them to use consequential thinking strategies when solving social problems, challenging and changing their attitudes and beliefs supporting the use of aggression in general and in retaliation for perceived slights, supporting the emergence of a sense of self-efficacy for responding in nonaggressive ways, and providing opportunities to receive rewards and respect for prosocial behavior.

Guerra and Slaby (1990) described a "cognitive mediation

training" program in which participants are trained to evaluate the consequences of their behavior. The program uses an eight-step sequential social problem-solving model: "(a) is there a problem? (b) stop and think, (c) why is there a conflict? (d) what do I want? (e) think of solutions, (f) look at consequences, (g) choose what to do and do it, and (h) evaluate the results" (p. 272). Once participants are introduced to the concept of consequential thinking (i.e., considering the potential outcomes of behavior), subsequent sessions emphasize the whole process of script evaluation. Program activities are conducted in a structured discussion format, driven primarily by the presentation of hypothetical conflict scenarios. For example, midway through the program participants hear a story about an incarcerated adolescent who wanted to watch his favorite TV show, but could not because another adolescent was already watching something else, half-asleep. Participants are challenged to generate and evaluate three ways to deal with the situation. In closing sessions, participants are asked to apply the same problem-solving model to personally relevant situations.

The "Yes I Can" curriculum, a school-based program within the Metropolitan Area Child Study (MACS; Metropolitan Area Child Study Research Group, 2002), incorporates "attitude-change" techniques commonly used in social-psychological research in order to change beliefs supporting the use of aggression. This curriculum includes techniques described by Huesmann et al. (1983). Participants were asked to produce a video for other schoolchildren who had been "fooled by television or harmed by television violence or got into trouble because of imitating it" (p. 905). Children were then guided through a process in which they first wrote paragraph-long essays in an attempt to persuade their hypothetical audience that imitating television violence is harmful. One week later, children reviewed their essays and then presented them individually in a talk-show format, with an experimenter serving as the moderator. These presentations were videotaped and replayed to the children afterward. Two to 3 months later, the children were told that their videos were "a big success" (p. 905) with the "audience." Huesmann et al. (1983) described the key aspects of implementing this effective attitude-change procedure: (a) crediting children for already holding the desired attitudes (praise for "knowing better" than another group of children), (b) inducing behaviors that lead to the self-attribution of these attitudes (e.g., writing persuasive essays in support of them), (c) inducing personal responsibility for outcomes based on these attitudes (helping hypothetical peers), (d) allowing participation out of free choice (students were asked to volunteer to help), and (e) promoting the perception that their behaviors were important (students were told at follow-up that their video was successful).

As described earlier, many programs include role-play activities as a way to provide opportunities for participants to learn to practice prosocial skills for handling social conflicts. These opportunities are also critical to the emergence of self-

efficacy for nonaggressive responding, particularly when practiced in the presence of aggressive cues (e.g., Lochman et al., 1987). Children who have practiced and mastered prosocial means of responding to conflict will be more likely to employ those strategies, as they should feel more competent to do so.

Certainly aggressive behavior is maintained in large part by contingencies beyond the school setting, such as exposure to aggression in the family, peer group, community, and media. To contend with these influences, schools recognize that they are responsible for helping students envision the long-term gains of prosocial behavior and create environments in which such behavior can be reinforced immediately (through rewards for good behavior, through awards for academic and extracurricular merit) and over the long term. Therefore, one way in which school programs can address the script-evaluation step of SCIP is through increasing student awareness of the potential long-term benefits of avoiding aggression. For example, schools could present speakers or panels composed of adults from their local community who have achieved successes (e.g., rewarding jobs and family lives) in the face of negative environmental influences.

Behavioral Response and Evaluation of Consequences

Once a script has been evaluated and enacted, children interpret the consequences of their behavior based on the environmental responses. What is the response of the school staff? What is the response of parents or guardians once the child goes home? What is the response of the peer group? The most effective overall environmental response is one that provides similar consequences for behavior across all sources. Program components addressing this step of the SCIP model will assist children by creating a school environment with consistently applied natural and logical consequences for both prosocial and aggressive behavior, coordinating the interests and involvement of families and schools in children's behavior, altering peer group beliefs and norms related to behavior, and encouraging the development of meaningful relationships between students and educators.

As noted, aggressive behavior at school is to a large extent the function of experiences outside of school, for example, neighborhood and family factors such as community violence, gang activity, and harsh and inconsistent parental discipline. Maintaining consistent responses to aggression is difficult if schools and families react to it in different ways. In recent years, some large-scale multisystemic intervention programs have made strides toward reducing the risk for the development of aggressive and other antisocial behaviors in part by uniting parents, teachers, and other school officials (e.g., school psychologists, principals) in working on this goal. Programs using this approach include Project FAST ("Families and Schools Together") Track (Conduct Problems Prevention Research Group, 1999a, 1999b) and MACS (Metropolitan Area Child Study Research Group, 2002). The thread running through these programs is an emphasis on

workshops and similar training forums (e.g., multiple family therapy groups; Tolan & McKay, 1996) designed to instruct parents and other family caretakers on the models used and skills taught in classroom-based programs.

A critical subset of the environmental response to aggressive behavior is the peer-group response. Researchers have noted that some programs designed to reduce antisocial behavior in delinquent adolescents have actually resulted in an *increase* in this behavior for participants (Dishion, McCord, & Poulin, 1999). The Yes I Can curriculum (Metropolitan Area Child Study Research Group, 2002) deals with peer-group issues by instructing children on the differences between helpful (i.e., prosocial) and hurtful (i.e., violent gangs) groups and encouraging them to maintain ties to helpful groups.

The environmental response step of SCIP is also targeted when programs attempt to enhance the quality and meaningfulness of the relationships among students and adults—teachers, parents, or older "mentors" who represent the adult world—within classrooms and beyond. Through this, students might come to value the benefits of avoiding aggression and behaving prosocially. One method of increasing students' ties with adults is through mentoring programs such as the Norwalk Mentor Program (S. G. Weinberger, 1992), in which adults from the community are paired with students for social or academic activities and career development.

Issues for Research: Limitations and Necessary Future Directions

The Role of Biopsychosocial Risk Factors in the Development of Aggressive Behavior

Dodge and Schwartz (1997) and Huesmann (1998) noted concerns pertaining to the use of SCIP models for explaining aggressive behavior. First, SCIP models might appear to disregard the influence of critical biopsychosocial risk factors for aggressive behavior (e.g., macrosystem influences such as sociocultural variables, neighborhood characteristics, and media effects; microsystem influences such as parenting practices and peer group effects). However, SCIP variables are construed as the person-level cognitive processing components of larger "developmental-ecological" (Conduct Problems Prevention Research Group, 1999a, 1999b) or "cognitive-ecological" (Metropolitan Area Child Study Research Group, 2002) theories of aggressive behavior development. The SCIP framework posits a mediational function of social-cognitive processes accounting for the relation over time between macrosystem and microsystem risk factors (i.e., environmental, temperamental, situational) and aggression. Indeed, for a selected sample of high-risk youth, the FAST Track multilevel intervention program (Conduct Problems Prevention Research Group, 1999a) adds several components to the social-cognitive school-based intervention to influence environmental and personal risk factors: parent group meetings

designed to improve parenting skills, build parental self-control, and foster a positive family-school relationship; child friendship groups to enhance social skills on a more intensive basis; a home-visiting component to promote parental problem-solving in relation to family-specific stressors; and academic tutoring sessions.

Relatedly, Huesmann (1998) and Dodge and Schwartz (1997) have noted that it is difficult to map SCIP functions onto specific biological or neurological processes; that is, the precise mechanisms linking early environmental influences and biological predispositions to social-cognitive information processing are as yet undetermined. Such criticisms can be directed at any model of behavioral development, however. For example, attachment, learning, family systems, and psychodynamic theories all rely on neural processes that are not directly observable. Nevertheless, future multidisciplinary research will help to clarify these links.

The Role of Emotional Regulation in SCIP Models

Huesmann (1998) has noted that social-cognitive models have been criticized as "cold" models, with no attention to the role of emotionality. For example, early social-cognitive models focused on the importance of training alternative and consequential problem-solving skills. Affect and its associated physiological arousal are intimately connected to cognition, however, as they influence each step of processing. Preexisting and situationally induced negative arousal can bias cognitive processing at the outset of a social situation. For aggression, arousal (e.g., anger) influences cognition by priming a child to attend to aggressive cues and recall aggressive scripts associated with those cues, leading ultimately to the enactment of aggressive responses. As described earlier, more contemporary school-based aggression-reduction interventions do indeed include emotional awareness and emotional regulation as critical program components.

The Need for Further Empirical Evidence of SCIP Mediation

The vast majority of empirical research demonstrating the role of social-cognitive and information-processing structures and functions in aggressive behavior has been correlational in nature. That is, researchers have typically sought to identify aggressive and nonaggressive children through teacher, parent, or peer nominations, and then examined SCIP differences between these two groups. However, SCIP has been advanced as a set of factors *mediating* the relation between preexisting and situational risk factors and aggressive behavior. Some research has demonstrated statistical mediation effects cross-sectionally (e.g., Marcus, Lindahl, & Malik, 2001; Musher-Eizenman et al., 2002). But, research must be conducted along longitudinal and experimental lines to demonstrate that SCIP variables serve to maintain the emission of aggressive behavior through mediation over time. For example, it must be shown that *changes* (through psychotherapeutic intervention, experimental manipulation,

etc.) occurring in SCIP variables lead to *changes* in aggressive responding.

Although additional work is clearly needed with regard to examining the full, unified SCIP model detailed by Huesmann (1998), there are now several studies demonstrating longitudinal mediation of aggression by specific SCIP variables (e.g., Dubow & Reid, 1994; Huesmann & Eron, 1986). As an example, Burks, Laird, Dodge, Pettit, and Bates (1999) examined the SCIP variables of "processing" (hostile bias and aggressive response selection, as measured by children's coded responses to hypothetical vignettes describing social challenges such as peer provocation) and "knowledge structures" (extent to which children accessed aggressive schemata, as measured by sentence completion tasks and perceptions of hostility in social environments). The authors found that these variables partially accounted for the relation between teacher-rated aggressive and antisocial behavior problems in kindergarten and those reported in eighth grade. Thus, Burks et al. (1999) demonstrated that SCIP variables serve to maintain partially the stability of aggressive behavior over time.

Few studies, however, have examined a model in which risk factors relate to aggressive behavior through SCIP pathways over time. Herrenkohl, Huang, Kosterman, Hawkins, Catalano, and Smith (2001) demonstrated that environmental variables such as neighborhood opportunities for prosocial and antisocial behavior partially predicted aggressive responding through the mediating variable of moral beliefs across middle adolescence (age 14 to age 16). Gomez, Gomez, DeMello, and Tallent (2001) assessed children's ratings of maternal discipline and emotional support as indicators of environmental risk for developing aggression-supporting SCIP styles. The authors demonstrated partial mediation between these variables (at time 1) and teacher-rated aggressive outcomes (time 2) through the SCIP factors of hostile bias and aggressive response selection (measured at time 2 in a fashion similar to that used by Burks et al., 1999). These results were obtained over 1 year on a clinical sample of young children referred for aggressive behavior problems (ages 9–11).

Some studies have examined the relation between changes in SCIP factors and changes in aggressive behavior (e.g., Hudley & Graham, 1993; Huesmann et al., 1983; Huesmann & Guerra, 1997). In a unique demonstration of SCIP mediation, Henry and colleagues (2000) examined classroom-level effects of normative beliefs on aggressive behavior in samples of inner-city elementary school children. Henry et al. (2000) found that, over a school year, aggressive student behavior was reduced when teachers and students made norms against aggressive responding salient (i.e., rejection of aggressive peers, teacher reprimands for aggression). The authors further showed that reductions in aggression were partially mediated by changes in students' normative beliefs about the acceptability of aggressive responding.

The Need for Further Empirical Evidence of the Interplay Among SCIP Variables

A somewhat overlooked concern in the research literature on SCIP mediation of aggressive behavior is the sequential nature of the SCIP model. Huesmann (1988) and Crick and Dodge (1994) proposed SCIP as including cognitive structures (e.g., scripts) and processes (e.g., cue attention) that interact in a stepwise manner. Scant research has studied whether these functions actually proceed in this fashion, however. An exception is a study reported by Zelli, Dodge, Lochman, Laird, and the Conduct Problems Prevention Research Group (1999). Zelli et al. (1999) found that the relation between normative beliefs and aggressive behavior was mediated in part by hostile processing (i.e., hostile attributional bias, aggressive response selection, positive evaluation of aggressive response). The authors did not examine a mediational model with the direction of effects between normative beliefs and hostile processing reversed, which is the sequence proposed by Huesmann (1998). Future studies need to examine the interplay and possible sequential relations among specific SCIP components through both longitudinal mediational studies as well as experimental designs. Regarding the latter, interventions that include training in single and multiple SCIP components can be compared with each other to address questions such as: "Which SCIP components should be targeted, either individually or in combination, for maximum effectiveness?" and "Does training in one SCIP component have positive effects on the development of other, untrained SCIP components?"

It is critical to note that the SCIP model refers to a sequence of cognitive events that can occur not only over time (e.g., learning a greater number of aggressive scripts in early childhood leads to easier accessing of these scripts in middle childhood or adolescence) but also in the course of a specific social situation (e.g., the feeling of anger enhances the likelihood of aggressive script activation). Therefore, a key avenue for future research will be the examination of "on-line" processing, that is, whether children are actually engaging in the mental processes suggested by SCIP when provoked. Much experimental research has explored immediate responses to events such as provocation, demonstrating that such events lead to aggressive responses (e.g., Chermack, Berman, & Taylor, 1997). Little is known about the on-line, actual cognitive experiences of individuals during such situations, however. Research tools such as experiential sampling methods (e.g., self-monitoring with pager notification; Hufford, Shiffman, Paty, & Stone, 2001) and "talk tables" (e.g., communicating specific thoughts and feelings during social experiences via mechanical instrumentation; Carels & Baucom, 1999) can allow investigators to explore these areas.

The Role of Age, Gender, and Ethnicity in SCIP Mediation

Future research on the SCIP model of aggression should attend to the potential moderating effects of age, gender, and

culture/ethnicity. Aggression, like other behavior problems in children, is not static. Problems can emerge at different developmental periods, and similar problems can manifest in varying forms at different ages (Achenbach, 1982). Researchers have found that aggression generally follows a reliable pathway from initial onset of "minor aggression" (teasing, being mean, hitting someone to hurt), to "physical fighting" (getting in many fights, involvement in gang fights), and finally to "violence" (physically attacking people, using weapons, coercion for sex, rape) (Loeber & Stouthamer-Loeber, 1998; Tolan et al., 2000). Tolan et al. (2000) found that among African American and Latino youth (approximate age 15 years), 94% of boys who engaged in violence had progressed through this pathway.

Developmental concerns with regard to SCIP mediation are also important when considered in the context of research and theory on social-cognitive development in general. Social-cognitive abilities such as perspective-taking (Selman, 1980), person perception (Ruble & Dweck, 1995), and moral reasoning (Tisak, 1995) are gradually acquired and enhanced over time. Therefore, the SCIP model can represent not only a process model with regard to specific situations, but also a developmental sequence of SCIP abilities emerging over time. For example, cue interpretation requires a child to possess the prerequisite abilities of emotional understanding (necessary for labeling arousal and recognizing its antecedents) and perspective-taking (necessary for comprehending the intentions of others). Script evaluation not only requires a child to have acquired some degree of causal understanding, but can also involve abstract moral reasoning. Future research should attempt to delineate the natural progression and integration of specific SCIP functions through childhood and adolescence. For instance, Huesmann and Reynolds (2001) reviewed studies demonstrating the existence of a critical period for the formation of certain aggression-supporting cognitions (e.g., normative beliefs). This period appears to occur during the early elementary school years, or ages 6 to 9 (Huesmann, 1998; Huesmann & Guerra, 1997).

Differences in aggressive behavior might also appear as the function of gender. Traditional conceptualizations of aggression have emphasized *overt* forms of aggressive responding (i.e., physically and verbally assaultive acts). Researchers studying these forms of aggression have concluded generally that males are more aggressive than females, as overt aggression is typically more common among males (Maccoby & Jacklin, 1974). Recent research has examined "indirect" or "relational" forms of aggressive behavior (i.e., acts aimed at harming relationships, such as ostracism), which might be more prevalent among females. Investigators in this area have shown that males and females display quantitatively similar amounts of aggression, but in qualitatively different forms (e.g., Crick, 1995; Lagerspetz & Björkqvist, 1994; Lagerspetz, Björkqvist, & Peltonen, 1988). Others have shown that boys and girls display similar amounts of rela-

tional aggression, though boys may still show more overt aggression (e.g., Henington, Hughes, Cavell, & Thompson, 1998). Initial examinations of SCIP in indirect/relational aggression have suggested that these behaviors might be maintained in ways similar to overt aggression (e.g., Crick & Werner, 1998; Musher-Eizenman et al., 2002).

Research has also pointed to the critical role of ethnicity and socioeconomic status in the development of aggression (e.g., Guerra, Huesmann, Tolan, Van Acker, & Eron, 1995). These risk factors can serve both distal (e.g., placing the child into an ecology more likely to foster aggression) and proximal (e.g., serving as ongoing stressors to create negative emotional states, creating potential provocation through racial conflict) functions in aggressive behavior. Guerra et al. (1995) noted that inner-city elementary school children are on average more aggressive than less disadvantaged children, and more likely to develop beliefs supporting aggression.

Issues for Practice: Programmatic Recommendations Based on the Unified SCIP Model

The purpose of this section is to provide both general and specific recommendations for school program developers, based on the unified SCIP model of aggressive behavior (Huesmann, 1998). We first review a set of concerns relevant to designing school-based programs for aggression in general before turning specifically to the ways in which designers can employ the SCIP framework to create useful and cost-effective programming.

Relying on a Theoretical Model

School-based interventions should be school-specific and derived from individualized needs assessments (Boxer et al., 2002; Cherniss, 1997). Regardless of the actual program components chosen by each school, Hunter et al. (2001) suggested the reliance on a clear theoretical perspective. The overarching concern of this article has been to offer a unified approach to school aggression based on core variables in contemporary theory and research in the area of SCIP mediation.

As noted, the unified SCIP model has not been examined with regard to actual school-based programming. That is, programs thus far have typically used only a few components of the model. Perhaps the only modest success of school-based programs (Howard et al., 1999) is in part related to training on only a limited number of SCIP variables. We suggest that program developers use a combination of approaches (as detailed in Figure 1) by integrating aspects of existing programs or designing new activities to address all four SCIP factors. Program activities should target factors affecting cue attention (e.g., empathy; Frey et al., 2000) and interpretation (e.g., hostile biases; Hudley et al., 1998); script search and retrieval (e.g., cue association, alternative thinking; Lochman et al., 1987); script evaluation (e.g., consequential thinking; Guerra & Slaby, 1990); and evaluation of

consequences (e.g., coordinating school-family interests; Metropolitan Area Child Study Research Group, 2002).

An important caveat to the notion of intervening based on the full model represented in Figure 1 is that it will be important for program developers to avoid attempts at doing "too much with too little." That is, it might be the case that all SCIP steps cannot be addressed simultaneously through the course of a single, classroom-based program delivered in 1-hour sessions over an entire semester. Program developers are encouraged to take a broad, longitudinal view of program implementation. Some SCIP functions might best be trained sequentially over a few semesters of instruction (e.g., attribution retraining in semester 1, alternative thinking in semester 2, and consequential thinking in semester 3, across second and third grades). At the same time, other important SCIP components, particularly those involving the larger ecology (e.g., implementing clear and consistent consequences for aggression across contexts), can be addressed for all grade levels simultaneously. Of course, the ultimate outcome of program development will depend in part on the capacities of individual schools and school districts (Boxer et al., 2002). More research, conducted with a careful integration of theory and practice, should attempt to delineate the most pragmatic and effective ways to implement programs based on the full SCIP model.

Evaluating Outcomes

Regardless of the specific theoretical approach ultimately chosen, program developers must carefully document the process of program implementation and conduct formal outcome evaluations (such as pre- and posttesting of children, interviews with teachers, examinations of disciplinary referrals). School-based practitioners and researchers can consult a guide prepared by the CDC (Dahlberg, Toal, & Behrens, 1998) that includes a variety of well-researched measures of social-cognitive information processes, in addition to macro-level variables such as environmental exposure to violence. With regard to assessing SCIP processes, evaluations should use measures of personal characteristics affecting cue attention (e.g., impulse control; D. A. Weinberger & Schwartz, 1990) and interpretation (e.g., hostile biases; Dodge & Frame, 1982); cognitive rehearsal affecting script search and retrieval (e.g., aggressive fantasies; Huesmann & Eron, 1986); cognitive beliefs influencing script evaluation (e.g., normative beliefs; Huesmann & Guerra, 1997); and cognitions related to the evaluation of consequences, such as outcome values (Boldizar et al., 1989). Evaluations should also assess aggression as an ultimate outcome of SCIP, for example, with peer nominations (Eron, Walder, & Lefkowitz, 1971) or teacher ratings (Dodge & Coie, 1987).

Attending to Potential Moderator Variables

Programs should take a developmental approach in targeting aggressive behavior. This issue has been raised before (e.g., Tolan, Guerra, & Kendall, 1995). However, newer

research on pathways through aggressive and antisocial behavior, coupled with views on the impact of “low-level” aggression (Goldstein, 1999)—teasing, name-calling, and disruptiveness, much of which can be seen very early in development—require that programs address the precursors to more serious aggression at younger ages.

The ways in which SCIP functions can be taught and trained will also necessarily vary by developmental level. For example, the PATHS program for early elementary school children includes activities as basic as instructing and encouraging children to point to cartoon faces that represent their internal mood states (Conduct Problems Prevention Research Group, 1999b). In contrast, Guerra and Slaby’s (1990) program for adolescents was administered almost entirely in a structured discussion format. It also appears that so far aggression reduction and prevention programs have been more effective for elementary school children than for students in middle school or high school (Howard et al., 1999). It is not clear whether this has resulted from an inability of older children to respond well to such programs because of biological (e.g., crystallizing neural development) or psychological (e.g., resistance, skepticism) variables or procedural weaknesses. Program developers should thus take care to ensure that SCIP concepts are presented in developmentally appropriate ways.

Programs must also be sensitive to different manifestations of aggression in boys and girls by targeting both overt and indirect aggression. Finally, studies of sociocultural differences in aggression imply that programs should strive as much as possible to include materials relevant to their target populations.

Intervening Multimodally

Research has shown that the development of aggressive behavior is related to a number of environmental (e.g., parenting practices, community and media violence, peer victimization), biological (e.g., difficult temperament, impulsivity), and situational (e.g., provocation, substance use) factors. As noted earlier, recent large-scale, multicomponent programs (e.g., classroom-based programs plus parent training; structured peer play groups) for curtailing aggressive behavior such as MACS and FAST Track have used an ecological approach (Conduct Problems Prevention Research Group, 1999a; Metropolitan Area Child Study Research Group, 2002).² This approach targets the multiple influences on aggressive behavior development, in addition to specific SCIP factors proposed to mediate aggression.

Multicomponent programs, though critical for informing research and practice and serving many children and families, require significant commitment of human and financial resources. For program designers without access to university resources, research centers, or major grant funding, the task of implementing potent, cost-effective solutions can be formidable. Our last task in this analysis is to suggest cost-effective ways to implement theory-driven SCIP interventions for schools with limited resources for program development and mental health services. We offer three specific recommendations for ways to incorporate cost-effective, SCIP-derived approaches into school-based aggression reduction and prevention efforts.

Integrating SCIP Cost-Effectively

1. *Consider incorporating SCIP concepts into classroom curricula.* Following Stephens (1994), we encourage school programmers to consider ways in which aggression-related materials and concepts can be integrated into regular classroom instruction. This is a key technique used in “social and emotional learning” programs (Elias et al., 1997, p. 1). For example, in Shure’s (1992) “I Can Problem Solve” curriculum, language instruction provides one avenue into explaining problem-solving concepts. Certain groups of words are applied to understanding the antecedents and consequences of behavior, such as “if–then,” “before–after,” and “now–later.” This contributes to cue-interpretation skills in that children would develop a vocabulary for interpreting the behavior of others.

Hypothetical conflict and provocation scenarios in which characters resolve problems prosocially could be used for reading instruction. This would expose children to new scripts for handling social situations without aggression. Additionally, discussion of these scenarios would not only develop the academic skills of comprehension and critical thinking, but would also enhance children’s script-evaluation skills. As an example, teachers might ask children to consider the costs and benefits of characters’ choices. Finally, such scenarios could be used to clarify the consequences of aggressive behavior by elaborating the intentions behind punishment (e.g., fairness to others, adherence to the law) and long-term outcomes (e.g., school failure, jail) of aggressive responding. This would aid children in anticipating and interpreting different environmental responses to aggression more clearly.

2. *Consider the ecology of the school.* Morrison, Furlong, and Morrison (1994) discuss the issue of moving from a school violence (i.e., trying to address and cope with sporadic aggressive acts) to a school safety agenda, striving to create safe school environments with “nurturing and positive alternatives” to aggression (p. 239). A safe school “guarantees the opportunity for development in the physical, social, and academic realms” (p. 241). Stephens (1994) and Riley and McDaniel (2000) offer practical guidelines and suggestions for drawing on schools’ available resources in order to

² Though not listed in the CDC guide, the LIFT (“Linking the Interests of Families and Schools”) Intervention (Reid et al., 1999) is another example of a developmental-ecological, multicomponent program that addresses aspects of the SCIP model. LIFT enhances the generalizability of skills learned through classroom-based instruction (script search and retrieval), and provides clear reinforcement for positive, prosocial behavior (script search, script evaluation, and interpretation of environmental response). This program has so far resulted in promising evaluative findings (Reid et al., 1999).

achieve safety. For example, Stephens (1994) suggests developing attractive extracurricular programs and providing adequate adult supervision. Riley and McDaniel (2000) advocate greater use of school counselors in providing aggression prevention and reduction services. From the SCIP perspective, creating a whole school ecology along these lines supports nonaggressive and prosocial behavior by focusing on the environmental response within the walls of the school.

Thus, school program designers interested in implementing SCIP-based approaches should consider the ways in which the whole school ecology can be used in support of aggression prevention. For example, is the school building safe? Is the relationship between students and educators adversarial? Is there a consistent policy for handling aggression? Are punishments for aggression reasonable and in proportion to violations? Are there opportunities for students to be rewarded for prosocial behaviors? Might there be ways to affect peer and staff responses to conflict and fighting? Ecological modifications in response to these issues can affect all steps of the SCIP model, for example, by improving school safety and thus reducing student anxiety (cue attention), increasing exposure to prosocial models (script search), allowing children to anticipate positive outcomes for prosocial behavior (script evaluation), and ensuring the use of fair consequences for aggression (interpretation of environmental response).

The PATHS developers (Conduct Problems Prevention Research Group, 1999b) devised ways to spread problem-solving materials (i.e., a stoplight diagram) around the physical school environment. School officials (at the middle and high school levels) might also consider soliciting the support of groups such as student councils for facilitating changes in student attitudes and norms regarding conflict and aggression. Changes in the salience of norms for aggressive responding have been shown to relate to decreases in actual aggressive behavior (Henry et al., 2000). Teacher workshops and in-service trainings could focus on incorporating SCIP concepts into behavior management and responses to conflict, as well as on ways to enhance the salience of aggression-related norms.

3. *Consider the larger community.* Efforts to reduce and prevent aggression should strive for a comprehensive approach in which all settings of a child's life can be reached in some form (Cunningham & Sandhu, 2000). Schools can

serve as a focal point for this approach. This might involve family workshops (e.g., to discuss ways to help caretakers alter aggression-supporting beliefs and reduce hostile biases) and involvement from community members (e.g., police officers or local officials presenting program curricula). We also endorse a community-collaborative approach to aggression prevention and reduction. In this approach, other concerned experts (e.g., community mental health center staff, staff from community agencies such as the Boys and Girls Club or YMCA/YWCA, local college or university faculty) could be consulted or included for school-based efforts. Often these parties have access to resources such as program materials and databases that can facilitate the creation of new school services and programs. The CDC's "Best Practices" guide³ provides a broad list of resources for aggression programming, including contact information for experts in the field. This guide can be used as an initial starting point for program designers interested in developing new programming.

Conclusions

Aggressive behavior among children and adolescents has been of persistent concern to researchers and practitioners for quite some time (Acosta, Albus, Reynolds, Spriggs, & Weist, 2001). School-based programs are an essential part of efforts to reduce and prevent aggression in youth (Farrell et al., 2001). Unfortunately, there is no easy remedy to the problem. Incorporating a unified SCIP approach to aggressive behavior into school policy and programming is a promising way to work toward reducing and preventing aggression among students. To do so successfully requires close and careful collaboration among schools, researchers, community stakeholders, and others committed to addressing the problem of school aggression (Boxer et al., 2002; Hunter et al., 2001). Field testing and dissemination of new programs based on the unified SCIP model will yield important information with regard to intervening effectively into aggression. Further, these efforts will contribute information necessary to the ongoing refinement of the SCIP perspective on aggressive behavior development.

³ Publications of the Centers for Disease Control and Prevention are available through the CDC's Web site at www.cdc.gov.

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