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The Relations of Effortful Control and Impulsivity to Children's Resiliency and Adjustment

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Abstract

The unique relations of effortful control and impulsivity to resiliency and adjustment were examined when children were 4.5 to 8 years old, and 2 years later. Parents and teachers reported on all constructs and children's attentional persistence was observed. In concurrent structural equation models, effortful control and impulsivity uniquely and directly predicted resiliency and externalizing problems and indirectly predicted internalizing problems (through resiliency). Teacher-reported anger moderated the relations of effortful control and impulsivity to externalizing problems. In the longitudinal model, all relations held at T2 except for the path from impulsivity to externalizing

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problems. Evidence of bidirectional effects also was obtained. The results indicate that effortful control and impulsivity are distinct constructs with some unique prediction of resiliency and adjustment.

The topic of emotion regulation currently is of great interest to developmentalists; however, it is a broad construct that requires greater clarity. One definition of emotion-related regulation is the process of initiating, precluding, inhibiting, maintaining, or modulating the occurrence, form, intensity, or duration of internal feeling states, emotion-related physiological processes, emotion-related goals, and/or behavioral concomitants of emotion, generally in the service of accomplishing one's goals (Eisenberg & Morris, 2002). Control (i.e., constraint or inhibition) can contribute to regulation (e.g., can inhibit the expression of emotion), but regulation involves more than control (e.g., it includes the ability to activate behavior and shift attention). Moreover, not all aspects of control contribute to regulation. Indeed, several theorists have argued that it is important to differentiate between emotion-related control that is flexible and adaptive and that which is rigid and less adaptive (e.g., Block & Block, 1980; Cole, Michel, & Teti, 1994). Building on the work of Derryberry and Rothbart (1997), Eisenberg (Eisenberg & Morris, 2002) differentiated between control that is voluntarily modulated and, hence, relatively flexible—henceforth labeled *effortful control*—and control that is more reactive (e.g., based more on reactive motivational systems), less voluntary, and less flexible—henceforth labeled *reactive control*. Eisenberg argued that only effortful control is truly part of emotion-related regulation.

Thus, Eisenberg's notion of emotion-related regulation includes Rothbart's construct of effortful control, defined as “the ability to inhibit a dominant response to perform a subdominant response” (Rothbart & Bates, 1998, p. 137) or the “efficiency of executive attention, including the ability to inhibit a dominant response and/or to activate a subdominant response, to plan, and to detect errors” (M. K. Rothbart, personal communication, January 26, 2002). Effortful control is a superordinate construct that includes attentional control (the abilities to focus or shift attention and persist on tasks) and activational or inhibitory control (i.e., the abilities to activate or inhibit behavior as is necessary to respond adaptively, even—or especially—when one does not want to do so). Rothbart (Rothbart & Bates, 1998) believes that effortful control is used to modulate temperamental reactivity (including emotional reactivity), but it likely also can be used to modify cognitions or behavior that are not emotionally charged. The brain structure most involved in effortful control is believed by Posner and Rothbart (1998) to be the anterior cingulate gyrus.

In contrast to effortful control, there are aspects of control, or the lack thereof, that seem to be involuntary or so automatic that they often are not under voluntary control; these are labeled *reactive control*. Reactive overcontrol is believed to be reflected in behavioral inhibition (i.e., the tendency to react to novelty, uncertainty, or stressful situations with slow, inhibited behavior) and in inhibited, rigid behavior more generally (Block & Block, 1980). Some have argued that such behavior is based partly on fear or anxiety (Derryberry & Rothbart, 1997; Gray & McNaughton, 2000); others believe it is based on reactivity to novel stimuli (Kagan, 1998). Reactive undercontrol includes impulsive approach behavior that seems to be “pulled” from the individual with little voluntary modulation. Pickering and Gray (1999) and others (Cacioppo, Gardner, & Berntson, 1999; Derryberry & Reed, 1994) have argued that the approach and avoidance motivational systems related to impulsive (undercontrolled) and overly inhibited behaviors are based primarily in subcortical systems (e.g., Gray's Behavioral Inhibition System [BIS], which is activated in situations involving novelty and stimuli signaling punishment or frustrative nonreward, and the Behavioral Activation System [BAS], which involves sensitivity to cues of reward or cessation of punishment). Although there is debate about the neurological bases of these reactive systems, there is some agreement that

effortful control and reactive systems are related, but different, aspects of functioning. Moreover, Mezzacappa and colleagues found factor-analytic (Kindlon, Mezzacappa, & Earls, 1995) and physiological (Mezzacappa, Kindlon, Saul, & Earls, 1998) evidence of a difference between executive control and motivational (i.e., reactive) control.

A construct related to regulation is personality (or ego) resiliency. Block and Block (1980) defined ego resiliency as "the dynamic capacity of an individual to modify his/her modal level of ego-control, in either direction, as a function of the demand characteristics of the environmental context" (p. 48). Thus, it sounds similar to effortful control. However, they also noted that it involves resourceful adaptation to changing circumstances and flexible use of problem-solving strategies, whereas low resiliency involves little adaptive flexibility, an inability to respond to changing circumstances, the tendency to perseverate or become disorganized when dealing with change or stress, and difficulty recouping after traumatic experiences. Block and Kremen (1996) further asserted that "the human goal is to be as undercontrolled as possible and as overcontrolled as necessary. When one is more undercontrolled than is adaptively effective or more overcontrolled than is adaptively required, one is not resilient" (p. 351). We view effortful control and reactive control as temperamentally based capacities of the individual, and resiliency as a personality measure reflecting how the individual responds and adapts to stress in various situations. Consistent with Block and Kreman's ideas, this situationally based response is expected to be influenced by both effortful and reactive control as well as by other temperamental and personality characteristics (e.g., emotionality), learning (e.g., of coping skills), and the nature of the stressors in a particular context. In other words, resiliency is viewed as less constitutionally based than are effortful and reactive control, and more of a measure of how well the individual adapts and deals with stressful interactions. In this sense, it is related to the construct of resiliency as used to describe positive adaptation despite adversity (Luthar & Cicchetti, 2000).

Relations of Effortful Control and Reactive Control to Adjustment

The primary purpose of the present longitudinal study was to examine the relations of effortful control (i.e., regulation) and reactive undercontrol (impulsivity) to children's internalizing and externalizing problem behaviors at two time points (2 years apart), to assess whether these relations hold over time when controlling for their consistency over 2 years, and to determine whether the relations of effortful control or reactive overcontrol to adjustment were mediated by personality resiliency or moderated by individual differences in proneness to anger or sadness.

Conceptually, one would expect both effortful control and reactive control to relate to children's adjustment because adjustment problems often are defined partly in terms of problems in controlling emotion (e.g., displaying high level of anger or anxiety) or behavior (e.g., externalizing problems such as aggression; American Psychiatric Association, 2000). Eisenberg and colleagues (Eisenberg, Fabes, et al., 2000; Eisenberg & Morris, 2002) presented a heuristic model in which they outlined the joint contributions of effortful or reactive control and negative emotionality to the quality of social functioning. They hypothesized that children prone to externalizing problems are undercontrolled because of both low levels of effortful control and high levels of reactive undercontrol (and perhaps low levels of reactive overcontrol). The abilities to shift and focus attention allow children to modulate affective arousal, to integrate information, and to plan, whereas the ability to inhibit behavior allows them to curb inappropriate behavior. In contrast, children with internalizing types of problem behaviors were hypothesized to be low in reactive undercontrol (i.e., impulsivity) and at least some types of effortful control—especially the abilities to activate behavior and to manage emotion with effortful attentional processes—and high in behavioral inhibition. If children can shift their attention away from distressing thoughts, events, or objects, they can modulate their

arousal, and the ability to initiate behavior is important to counteract social withdrawal due to reactive overcontrol.

Initial empirical work is consistent with the notion that children's externalizing problems are linked with low effortful control or high impulsivity, or both (e.g., Calkins & Dedmon, 2000; Colder & Stice, 1998; Kochanska & Knaack, 2003; Lemery, Essex, & Smider, 2002; Mezzacappa, Kindlon, & Earls, 1999; Olson, Schilling, & Bates, 1999). At the first assessment of the sample in this study, compared with nondisordered children, children with borderline or clinical levels of externalizing problems (even if they had comorbid internalizing problems) were relatively low in effortful attentional and inhibitory control (the ability to inhibit behavior effortfully) and were high in impulsivity (Eisenberg, Cumberland, et al., 2001). However, the unique relations of effortful and reactive control to externalizing behavior (i.e., relations when controlling for the effects of one another) rarely have been examined, especially over time. In a study with a different sample, Eisenberg, Guthrie, et al. (2000) found that effortful attentional and behavioral control (a combination of effortful inhibitory control and low ego or reactive control) uniquely predicted externalizing symptoms. However, in that study, effortful control and impulsivity were not differentiated and internalizing problems were not assessed.

There also is evidence, albeit much more limited, linking internalizing problem behaviors with effortful control or reactive control, although most of this work pertains to the link between internalizing problems and behavioral inhibition (Rosenbaum et al., 1993; also see Huey & Weisz, 1997). In regard to effortful control, Lemery et al. (2002) found that mothers' reports of children's anxiety and fearfulness correlated with their reports of low attention focusing and inhibitory control. In the first assessment of children in the sample in the present study, children with pure (i.e., not comorbid) internalizing problems, compared with nondisordered children, were low in impulsivity and in attentional effortful control (albeit not especially low in inhibitory control), sometimes even when different reporters rated adjustment and regulation (Eisenberg, Cumberland, et al., 2001). In contrast, Murray and Kochanska (2002) found that very high levels of their observational measure of high effortful control were associated with internalizing problems. However, this measure of effortful control also may have tapped reactive control because it is difficult to know if some observed approach or inhibited behaviors were due to effortful control, reactive approach to rewards, or reactive inhibition due to punishment (Eisenberg & Morris, 2002). Moreover, the relation between effortful control or reactive control and internalizing symptoms has not been examined over time to determine whether the relation persists when taking into account earlier levels of internalizing problems. It is possible that links between effortful or reactive control with adjustment are forged relatively early in life and are simply stable over time; alternatively, the relations among these variables may vary in strength and relations at older ages may not simply be due to high stability of children's adjustment over time.

Resiliency: Its Relations to Effortful and Reactive Control and Role as a Mediator

A related issue is whether personality (or ego) resiliency mediates the relations of effortful or reactive control to children's adjustment. If individuals are able to modulate their control as needed, they would be expected to have an advantage in regard to adapting effectively in stressful situations. Consistent with this idea, Eisenberg, Spinrad, and Morris (2002) found that effortful control related positively to resiliency. Moreover, resiliency has been found to mediate the relation of effortful attentional control (but not a mixture of effortful and less effortful behavioral control) to children's social competence (Eisenberg, Fabes, et al., 2000). Although children with externalizing problems tend to be low in resiliency (Eisenberg et al., 1996), resiliency did not mediate the relations of effortful attentional control to externalizing problems in a nonselected (normative) sample of school children (unpublished data; Eisenberg, Guthrie, et al., 2000).

An interesting question is whether impulsivity has a relation to resiliency that is unique from that between effortful control and resiliency and the direction of that relation. Because an emotional vulnerability is so central to internalizing problems, we hypothesized that relations of effortful control (and impulsivity) to internalizing problems would be primarily through their effects on resiliency. In a sample of preschool children, Cumberland, Eisenberg, and Reiser (in press) found a positive correlation between impulsivity and resiliency; a similar positive (albeit weak) relation was found in the initial assessment of the children in the present study (Eisenberg et al., 2002). This relation is consistent with Block and Kremen's (1996) assertion that humans are motivated to be as undercontrolled as possible (and only as overcontrolled as necessary). If they are correct, resiliency would be expected to relate to the capacity to be spontaneous—and perhaps a bit impulsive—as well as to the ability effortfully to inhibit or control that spontaneity when necessary or voluntarily allow oneself to be spontaneous when appropriate (which is different from impulsivity). However, it appears that this positive linear relation between impulsivity and effortful control decreases with age (Eisenberg et al., 2002). In the present study, we assessed whether there were unique positive relations of effortful control and impulsivity to resiliency and if these relations were found at two ages 2 years apart.

Although to our knowledge not yet tested, it is reasonable to hypothesize that resiliency mediates the negative relations of effortful control and impulsivity to children's internalizing symptoms. Children with internalizing problems tend to lack flexibility in dealing with novel and stressful situations and have been found to be low in resiliency (Huey & Weisz, 1997). A relatively low level of effortful attentional control (Eisenberg, Cumberland, et al., 2001) may reduce children's ability to rebound from stress, which results in a higher probability of exhibiting internalizing problem. Thus, in this study, we examined resiliency as a mediator of the relations between effortful control or impulsivity and internalizing problems.

Moderation by Negative Emotion of the Relations of Effortful or Reactive Control to Adjustment

Eisenberg, Fabes, et al. (2000) hypothesized that the aforementioned relations between regulation and control and adjustment often are moderated by level of dispositional negative emotionality such that regulation and reactive control are reactive better predictors of adjustment for children predisposed to experience negative emotions. There is support for this notion in research examining the relation of regulation and control to externalizing problems (Colder & Chassin, 1997; Eisenberg, Guthrie, et al., 2000; albeit not in Belsky, Friedman, & Hsieh, 2001, in a study of toddlers) and social competence (Belsky et al., 2001; Eisenberg, Fabes, et al., 2000). However, moderation by negative emotionality of the relation of impulsivity to problem behaviors seldom has been examined, particularly when effortful control and impulsivity were differentiated and when internalizing problems were assessed.

Moreover, in most research examining such moderational effects, different negative emotions have not been differentiated, although emotions such as anger and sadness likely are differentially related to externalizing and internalizing problems (Rothbart & Bates, 1998). Anger has been more strongly related to externalizing than to internalizing problems, whereas sadness has clearer links with internalizing problems (although it does have some association with externalizing problems; Eisenberg, Cumberland, et al., 2001; also see Lemery et al., 2002). It is likely that children with externalizing problems are somewhat prone to sadness because they tend to have difficulties in social relationships (e.g., with peers; Rubin, Bukowski, & Parker, 1998); thus, sadness may be more of an outcome than a contributor to externalizing problems. If proneness to anger heightens children's vulnerability to externalizing problems whereas sadness does the same for internalizing problems, anger might be expected to moderate relations of effortful or reactive control to externalizing problems. In contrast, sadness might

moderate their relations to internalizing problems. For example, for children prone to anger (as compared with those low in anger proneness), regulation or low impulsivity may be especially important in reducing the likelihood of developing externalizing problems. Partly consistent with these predictions, Colder and Stice (1998) found that high levels of anger were positively associated with delinquency for impulsive, but not nonimpulsive, adolescents, at least in concurrent analyses. In the present study, we examined anger and sadness as moderators of the relations of both impulsivity and effortful control to externalizing and internalizing problem behaviors.

Predictions in regard to the role of negative emotions as moderators of the relations of effortful control and impulsivity to resiliency are less clear. Eisenberg et al. (1997) tested whether children's negative emotionality moderated the relation of effortful attentional control to resiliency. In this sample of unselected school children, this relation was stronger for young children who were high in negative emotionality, although it also was significant for those low in negative emotionality. Moreover, this interaction was found 2 years later, at least in a structural equation model (SEM; Eisenberg, Fabes et al., 2000). In that study, impulsivity per se was not assessed; nor were anger and sadness differentiated. Thus, in the present study, anger and sadness were examined as moderators of the relations of effortful control and impulsivity to resiliency. Consistent with prior discussion, we expected individuals who are effortfully controlled to be more resilient, and this relation should be strongest for children prone to anger (who need more control). Conversely, it is possible that impulsivity is less positively related to resiliency for individuals who are prone to anger.

The Present Study

In the present study we examined the relations of effortful control and impulsivity to children's internalizing and externalizing problems in early childhood (ages 4.5 to 8 years) and 2 years later. Because early problem behaviors often predict relatively serious problems with adjustment years later (Broidy et al., 2002; Coie & Dodge, 1998), we began the study when the children were fairly young. Unlike in much prior work on related issues, the sample in this study was selected to include a number of children with at least borderline clinical levels (or higher) of internalizing and externalizing problems. Moreover, the emphasis in this study was on the distinction between effortful control and impulsivity, not on the distinction between attentional and behavioral aspects of control (regardless of whether they were effortful or reactive, as in Eisenberg, Fabes, et al., 2000). This is important because we believe that the difference between effortful and reactive control is more fundamental to explaining adjustment problems than are differences among various aspects of effortful control (especially if mixed with reactive control, as in the past). It is effortful control, not simply inhibition of attention or behavior, that would be expected to promote adaptive behavior. In separate concurrent SEMs, we examined whether impulsivity and effortful control uniquely predicted resiliency, externalizing problems, and internalizing problems. This differentiation between impulsivity and effortful control has been examined in only one other study, but it included a small sample of preschoolers, single-reporter measures of effortful control, reactive control, and resiliency, and no assessment of adjustment (Cumberland et al., in press). In other recent work, ego control has been examined as an index of reactive control, but it may not be as clean a measure of the construct (because of items that may tap effortful control) as is impulsivity. In any case, it is useful to assess reactive control in different ways and see whether findings converge across measures. In addition, we know of no study in which the unique relations of reactive control (however assessed) and effortful control to internalizing problems (and mediation thereof by resiliency) have been examined. By including both internalizing and externalizing problems in SEMs, we could correlate the two constructs and thereby examine their relations to other variables (e.g., resiliency or effortful control) while assessing the overlap between the two. Furthermore, in some models we assessed potential bidirectional paths of effortful or reactive

control predicting resiliency and adjustment versus adjustment predicting subsequent effortful or reactive control. In addition, a unique feature of this study was the examination of anger and sadness, rather than an aggregate measure of negative emotionality, as moderators of relations between effortful or reactive control and other variables.

We expected effortful control to predict low levels of both externalizing and internalizing problem behaviors, and for its relation to internalizing problems to be partially or fully mediated by resiliency (see Figure 1). Impulsivity was expected to relate positively to resiliency and externalizing problems; it also was predicted to be indirectly related to internalizing problems through its relations to resiliency (which was expected to be negatively related to internalizing). Because effortful control may increasingly modulate the overt expression of impulsive tendencies, relations of impulsivity to resiliency and externalizing problems were predicted to become weaker with age. Based on prior findings and the notion that resiliency involves both effortful control and a modicum of impulsivity, we also predicted both effortful control and impulsivity would provide unique prediction of resiliency. We hypothesized that these relations (except perhaps those for impulsivity) would hold at the second assessment (Time 2, or T2), even when consistency in the variables was taken into account. Such a pattern of findings would indicate that effortful control and impulsivity have relations to problem behaviors at T2 that are not due solely to earlier levels of the variables and their interrelations. Moreover, we expected anger to moderate the relations of effortful control and impulsivity to externalizing problems and sadness to moderate their relations to internalizing problems.

One problem in studying the relation of temperamental characteristics to adjustment is the possible confounding of measures of these constructs. Empirical findings indicate that such confounding of items is a greater problem for internalizing than externalizing problem behaviors (Sanson, Prior, & Kyrios, 1990). However, Lengua, West, and Sandler (1998) and Lemery et al. (2002) generally found similar patterns of findings when confounded and unconfounded measures were used in analyses of the relations between temperament (including regulation) and adjustment. Nonetheless, in the present study, based on expert ratings, we removed the items that differentiated least clearly between temperamental regulation and children's adjustment in an attempt to minimize any possible confounding of measures. Based on the findings of Lengua et al. and Lemery et al., this was considered a conservative, albeit not necessary, approach.

Method

Participants

Participants were recruited through the local preschools and elementary schools, newspaper ads, and flyers that were placed at after-school programs and children's stores in a large metropolitan area in the Southwest. Because the goal of the study was to determine the factors associated with risk for behavior problems, we used a selective screening procedure for inclusion in the study. Phone calls were made to all interested families and a parent, usually the mother, was administered the Child Behavior Checklist (CBCL; Achenbach, 1991a, 1991b). From a pool of 315 children, we selected all children with *T* scores of 60 or above on either internalizing or externalizing behavior problems. We dropped several items considered offensive to some parents (e.g., regarding sexual behavior) so that scores of 60 could have been slightly higher than 60 if we had used the entire scale. In prior work, CBCL *T* scores of 60 to 69 have been considered moderately at risk (Achenbach, 1991b), whereas scores of 70 or higher have been viewed as indicative of clinical problems. We matched these children (considering them as either externalizing or internalizing depending on which *T* score was higher) with control children of the same sex and race, similar social class (using parental reports of education and occupation), and approximately the same age. Control children were those with CBCL scores of less than 60 on both internalizing and externalizing scales. Thus, children with

scores on internalizing and externalizing greater than, less than, and equal to 60 were included. Some families never came to the laboratory; therefore, this method resulted in approximate matching (see Eisenberg, Cumberland, et al., 2001, for numbers of children in the problem behavior groups if one used Achenbach's *T* scores, uncorrected for potential confounding of items).

The final sample at Time 1 (T1) included a parent (203 mothers, 11 fathers) and 214 children (96 girls: *M* age = 74.58 months, *SD* = 10.16; 118 boys: *M* age = 72.58 months *SD* = 9.05). Most children were non-Hispanic Caucasian (76%), 12% percent were Hispanic, 5% were American Indian, 3 % were African American, less than 1% were of Asian origin, and 3% were of mixed origin. (These percentages differ slightly from those in Eisenberg, Cumberland, et al., 2001, because of data obtained at T2 for a child who was missing ethnicity or race data at T1.) Sixty-eight percent of children came from two-parent households, 20% came from single-parent households, and 7% were in extended families (5% did not respond or reported “other”). Mean years of maternal and paternal education were 14.11 (*SD* = 2.49) and 14.06 (*SD* = 3.05), respectively (*ranges* = 7 – 20 years and 8 – 20 years; respectively, with 12 = high school and 16 = college). Primary caregivers (who provided the main questionnaire data) were 209 mothers and 5 fathers. Family income ranged from $6,000 to $160,000 (*Mdn* = $35,000; also see Eisenberg, Cumberland, et al., 2001; Eisenberg, Gershoff, et al., 2001). Based on the reports of the primary caregiving parent (usually mothers), numbers of children scoring 60 or above on the CBCL on internalizing, externalizing, or both were 110, 104, and 74, respectively.

Two years later, 193 children (90% of the T1 sample) and a parent (182 mothers, 3 grandmothers, and 8 fathers) participated in a second assessment (T2). The participants were 88 girls (*M* age = 7.72 years, *SD* = .84) and 105 boys (*M* age = 7.61 months, *SD* = .83); 66% were in two-parent families. Based on the reports of the primary caregiving parent (usually mothers), numbers of children scoring 60 or above on the CBCL on internalizing, externalizing, or both were 87, 74, and 52, respectively. The individuals who participated at both assessments were compared with those who were lost due to attrition on the T1 demographic and study variables. In comparison to families who had data at both time points, fathers in attrited families were less educated, $t(204) = 1.96$, $p = .05$. Children who had data at both time points were more likely to be Caucasian (77%) than those who did not (67%), $\chi^2(5) = 12.13$, $p<.03$; American Indians were especially likely to have attrited. In addition, children in the 21 families that had no data at T2, compared with those that had at least some data at T2, were rated as lower in effortful attentional control by mothers and teachers at T1, ts(207 and 193) = 1.97 and 2.18, ps<.05 and .03, respectively, and as less resilient by parents, $t(209) = 2.37$, $p<.02$.

Procedure

At both time points children came with a parent to a laboratory on campus to participate in the experimental session (19 families at T2 participated only by mail). Early in the session, the parent was escorted to another room to complete several questionnaires. As part of a series of tasks, the child completed a puzzle task designed to assess regulation (persistence). At the end of the session, the child was debriefed and the participants were paid. In addition, problem behavior questionnaires were sent home for fathers to fill out and return by mail (sample numbers for fathers with problem behavior data were 116 and 115 at T1 and T2, respectively), and parents were asked to give permission for questionnaires to be sent to the child's teacher.

Measures

Parents and teachers completed measures of children's regulation and reactive control, resiliency, negative emotionality, and reactive problem behaviors. Children participated in a behavioral measure of regulation.

Procedures for removing overlapping items in the temperament and problem behavior scales—To reduce confounding of measures of temperament and behavioral problems, we excluded items on the temperament scale that reflected psychopathology, and vice versa. To determine overlapping items, temperament items from the Child Behavior Questionnaire (CBQ; Goldsmith & Rothbart, 1991; Rothbart, Ahadi, Hershey, & Fisher, 2001) reflecting attention shifting, attention focusing, inhibitory control, sadness, and anger, and child psychopathology items reflecting externalizing and internalizing problems from the CBCL (Achenbach, 1991b) were rated by experts. Specifically, 32 experts in the field of temperament and child psychopathology (24 faculty, 8 graduate students) completed a questionnaire measure assessing how much each item reflected either temperament or behavior problems (1 = much better measure of temperament; 3 = not a better measure of temperament or symptoms, substantial content for both; 5 = much better measure of symptoms than temperament). The mean rating for each item was calculated: Items that experts rated as a better measure of the construct other than the construct intended were considered to be contaminated. In other words, temperament items receiving mean scores of greater than or equal to 3.00 and symptom items receiving 3.00 or less were removed from the corresponding scale (see the following).

Children's dispositional regulation (effortful control) and impulsivity—Both teachers and the primary caregiving parent completed indexes of effortful control and impulsivity from the CBQ. The CBQ was designed for parents' reports; thus, some items were dropped or modified slightly to make them appropriate for teachers. Effortful control was assessed with three subscales: attention shifting, attention focusing, and inhibitory control. The attention shifting scale initially consisted of 12 items for both parents and teachers assessing the child's ability to willfully move attention from one activity to the next (e.g., “Can easily leave off working on a project if asked”). Attention focusing was initially assessed with 10 items for parents and 9 items for teachers indicating the child's ability to concentrate on a task when needed (e.g., “When drawing or coloring in a book, shows strong concentration”). Then, one item each from the attention shifting (i.e., “Needs to complete one activity before being asked to start on another one”) and attention focusing (i.e., “Has difficulty leaving a project she/he has begun”) subscales was dropped for both parent and teacher reports because they lowered the alphas substantially. Based on the experts' ratings, an additional 2 of 11 items for both parent and teacher reports were deleted for the attention shifting subscale (“Sometimes has a dreamy quality when others talk to her/him, as if she/he were somewhere else” and “Sometimes doesn't seem to hear me when I talk to her/him”). Alphas at T1 and T2 for the corrected 9-item attention shifting subscale were .80 and .79 for parents and .86 and .88 for teachers, respectively. Alphas at T1 and T2 for the attention focusing subscale at T1 and T2 (9 items for parents, 8 for teachers) were .88 and .72 for parents and .85 and .82 for teachers, respectively.

Parents' and teachers' reports of attention focusing and attention shifting were significantly positively correlated both for parents and for teachers at T1, $rs(207, 193) = .37$ and .61, $ps < .01$, and at T2, $rs(181, 178) = .47$ and .57, $ps < .01$. Thus, to reduce the number of variables, we created separate composites for parents' and teachers' attentional control by averaging the scores for attention shifting and focusing. This composite is henceforth labeled *attentional regulation* to indicate it includes effortful attentional processes.

The inhibitory control subscale consisted of 13 items that assessed the child's ability to regulate his or her behavior (e.g., “Can lower his/her voice when asked to do so”). Alphas were .84 and .88 for parents and teachers, respectively, at T1, and .81 and .91 at T2.

Impulsivity (reactive undercontrol) was measured with the impulsivity subscale of the CBQ that consists of 13 items tapping the child's tendency to act without thinking (e.g., “Sometimes

interrupts others when they are speaking"). One item from the teacher-reported impulsivity subscale was dropped (i.e., "When eager to go outside, sometimes rushes out without putting on the right clothes") because it substantially reduced the alpha at T2; no items were removed from this scale based on experts' ratings (αs = .81 and .88 for parents and teachers, respectively, at T1, and .79 and .84 for parents and teachers, respectively, at T2).

Children's ego resiliency—Parents and teachers rated children's ego resiliency using a questionnaire that was adapted from the Block Q-Sort measure (Block & Block, 1980). Using clinicians' ratings obtained from the Blocks (Block & Block, 1969), Eisenberg et al. (1996) selected items rated as reflecting resiliency; then, items that most clearly reflected social skills or overt emotional expressions (based on the consensus of three experts) were dropped. The resiliency Q-Sort was reduced to 24 items and one of these items was then dropped because it substantially lowered the alpha (see Eisenberg et al., 1996, for details).

Because many of the items still may have overlapped with other constructs, an even "purer" version of the resiliency scale was obtained. Five faculty and five graduate students with relevant expertise rated the 23 resiliency items as to how much they reflected pure resiliency. Resiliency was defined as flexible, adaptable behavior. Instructions were to rate each item based on how well it tapped resiliency (regardless of valence of the item) from 1 (*not at all descriptive of resiliency*) to 9 (*most descriptive of resiliency*; see Cumberland et al., in press). Only the 7 items that obtained a mean score of 7 or above were retained (e.g., "Can bounce back or recover after a stressful or bad experience," "Freezes up when things are stressful, or else keeps doing the same thing over and over again"; αs = .68 and .81 for parents and teachers, respectively, at T1, and .66 and .80 for parents and teachers, respectively, at T2).

Children's dispositional emotionality—Parents and teachers rated from 1 (*extremely untrue*) to 7 (*extremely true*) children's dispositional emotionality with two subscales from the CBQ (Rothbart et al., 2001). The original anger and frustration subscale consisted of 13 items for parents and 11 for teachers (e.g., "Gets angry when told he/she has to go to bed"). One item was dropped from the teacher-report scale because it lowered the alpha substantially. Two additional items were dropped based on the experts' ratings of overlap with the problem behavior measure (i.e., "Gets mad when even mildly criticized," "Has temper tantrums when she/he doesn't get what she/he wants"). The resulting parent- and teacher-report anger scales (11 and 8 items, respectively) had alphas of .78 and .88 at T1 and .80 and .89 at T2.

The sadness subscale (e.g., "Cries sadly when a favorite toy gets lost or broken") initially consisted of 13 items for parents and teachers. Two items were dropped from the teacher-report scale because they lowered the alphas substantially. Then, three additional items were deleted based on the experts' ratings with regard to overlap ("Seems to feel sorry for himself/herself when things are going badly," "Seems to feel depressed when unable to accomplish some task," and "Sometimes appears downcast for no reason"). Alphas for the corrected 10- and 8-item scales for parent and teacher were .64 and .73 at T1 and .66 and .72 at T2.

Children's problem behaviors—Mothers and fathers completed the CBCL and teachers completed the Teacher's Report Form (Achenbach, 1991a, 1991b) to assess children's problem behaviors. Reporters indicated from 1 (*never*) to 3 (*often*) whether items were indicative of the child's behavior. Two broad scales, internalizing and externalizing problems, were used. The broad internalizing scale consisted of three subscales: social withdrawal (9 items), anxiety and depression (18 items for parents, 14 for teachers), and somatic complaints (9 items). The externalizing subscales were aggression (20 items for parents, 25 for teachers) and delinquency (11 items for parents, 6 for teachers).

Based on the experts' rating, we dropped: 3 social withdrawn items for both parents and teachers; 2 anxious and depressed items for teachers and 1 for parents; and 3 aggression items for teachers and 2 for parents. For the corrected internalizing scale, αs were .84 and .87 for parents' and teachers' reports at T1 and .88 and .90 at T2. For the overall corrected externalizing scale, αs for parents' and teachers' reports were .90 and .95 at T1 and .89 and .96 at T2. As suggested by Achenbach (1991b), the continuous CBCL scores were used in correlations and regressions, as well as in the SEM analyses (see Eisenberg, Cumberland, et al., 2001, for T1 analyses of problem behavior groups using CBCL *T* scores).

Children's observed persistence—Children's persistence in the face of a challenging task was assessed with the use of a puzzle box task (Eisenberg et al., 1996); this considered a measure of attention focusing or inhibitory control. Children were shown a 24 in. × 12 in. × 14 in. box that contained a puzzle with geometric-shaped pieces and had a clear Plexiglass back so that the child's hand movements could be observed. A cloth covered the front of the box and had sleeves that the children slipped their arms through. This cloth could be lifted up so that the child could cheat by looking at the puzzle. Children were told to try to assemble the puzzle without looking at it and that if they finished the puzzle within 5 min (or 4 min at T2), they would receive an attractive prize. Interrater reliabilities for persistence (based on 111 observations at T1 and 79 at T2) were .99 and .96 at T1 at T2, respectively. Proportion scores were computed by dividing the amount of time the child worked on the puzzle by the number of seconds the child was alone with the task (and had not finished it). Thus, the observed persistence proportion score represented the time the child persisted on the challenging task rather than being off task or cheating.

Results

Descriptive Analyses

Relation of child sex and age to the major variables—Means and standard deviations for the major variables are presented in Table 1. Correlations were computed to examine the relations of age to the major variables. At T1, age was positively related to parents' reports of inhibitory control, attentional regulation, and internalizing problems (the latter for both mothers' and fathers' reports), *r*s(207, 207, 207, 114) = .14, .16, .15, and .20, *p*s<.04, .02, .03, and .03, and negatively related to reports of anger and impulsivity, *r*s(207, 207) = −.14 and −.19, *p*s<.05 and .01. At T2, age was positively correlated with mothers' and fathers' reports of internalizing problems, *r*s(190, 113) = .17 and .20, *p*s<.02 and .03, and negatively related to impulsivity and resiliency, *r*s(181, 183) = −.15 and −.17, *p*s<.04 and .02. Older children also were more likely to be on task during the puzzle task o at both T1 and T2, *r*s(210, 172) = .13 and .15, *p*s<.06 and .05. Thus, older children generally were viewed by their caregivers as more regulated and prone to internalizing problems and less impulsive. However, age was not significantly related to teachers' reports on any of the major variables.

Correlations among reports of problem behaviors—Correlations among mothers', fathers', and teachers' reports of children's problem behaviors at T1 and T2 are presented in Table 2. Of the possible correlations 68% were significant at .05, far more than would be expected by chance (many of the nonsignificant correlations were for teachers' reports of internalizing). Children's internalizing and externalizing problems were positively related within reporters. In addition, externalizing was positively correlated across reporters and time; analogous correlations for internalizing were weaker and sometimes not significant (e.g., T2 teachers' reports of internalizing did not correlate with parents' reports).

Correlations among regulation (effortful control), impulsivity, and resiliency—Correlations between parents' and teachers' reports of children's regulation, impulsivity,

resiliency, and observed persistence at T1 and T2 are presented in Table 3. Approximately 70% of the correlations were significant at the .05 level, far more than would be expected by chance. Reports of impulsivity generally were negatively related to regulation variables, within and across reporters and time. In addition, attentional regulation, inhibitory control, and observed persistence were for the most part positively correlated within and across time and reporters. Resiliency generally was positively related to impulsivity and indexes reflecting effortful control (i.e., regulation).

Correlations between anger and sadness variables—Correlations also were computed between parents' and teachers' reports of children's anger and sadness at T1 and T2. Of the possible correlations, 50% were significant at the .05 level. Within reporter and time, reports of anger or sadness tended to be correlated with one another, *r*s ranged from .38 to .69, *p*s<.01. Moreover, parents' reports of anger were correlated from T1 to T2, as were their reports of sadness, *r*s(177) = .65 and .56, *p*s<.01, respectively; analogous correlations for teachers also were significant, *r*s(153, 142) = .34 and .23, *p*s<.01 (different teachers provided ratings at T1 and T2). Parents' and teachers' reports of anger were significantly related at T1 but not at T2, *r*s(189, 166) = .25 and .06, *p*s<.01 and *ns*; reports of sadness were marginally correlated across reporters o at T1 and T2, both *rs*(175, 165) = .13, *p*s<.09.

Relations of effortful control and impulsivity to resiliency and adjustment—Zero-order correlations of internalizing and externalizing measures with indexes of effortful control, impulsivity, and resiliency are presented in Table 4. These correlations changed relatively little when age or sex were controlled in partial correlations. In general, ratings of externalizing problems were negatively related to measures of effortful control and resiliency and positively related to impulsivity. Ratings of internalizing problems also tended to be negatively related to ratings of effortful control (albeit not observed persistence) and positively related to resiliency (especially as reported by parents). It is noteworthy that the two unexpected significant positive correlations between mothers' or fathers' reports of internalizing at T1 and T2 observed persistence were only marginally significant when sex and age were partialed. Moreover, as was reported in Eisenberg, Spinrad, and Morris (2002), at both ages there was a quadratic relation in regression analyses between teachers', but not parents', reports of impulsivity and resiliency, such that children average in impulsivity were more resilient than children low in impulsivity, but children average and high in impulsivity were similar on resiliency.

We also examined the correlations among the same variables when uncorrected for confounded items. The pattern of relations was highly similar, suggesting the dropping confounded items had little effect on the findings.

SEM was used to test the unique relations of effortful control and impulsivity to problem behaviors and resiliency, as well as mediation of the relations to internalizing by resiliency. Mplus 2.02 (Muthen & Muthen, 2002) was used because it accounts for missing data by using a maximum likelihood method estimation.

The models contained five latent constructs: effortful control, impulsivity, resiliency, internalizing problems, and externalizing problems. For effortful control, teacher- and parent-rated attentional regulation (the composite of attentional shifting and focusing), teacher- and parent-rated inhibitory control, and persistence on the puzzle task were indicators. For impulsivity and resiliency, teachers' and parents' ratings were indicators. For externalizing or internalizing behavior problems, initially mothers', fathers', and teachers' ratings were indicators (although teachers' ratings of internalizing subsequently were dropped, as described later).

Measurement models—Because inhibitory control has been used as an indicator of behavioral regulation (in contrast to attentional regulation) in some work (see Eisenberg et al., 1997), we first contrasted two measurement models involving only the measures of control (effortful or reactive). In the first model, attentional regulation, inhibitory control, and observed persistence were used as indicators of effortful control, and teacher- and parent-rated impulsivity were used as indicators of the latent construct of impulsivity (the latent constructs also were correlated, and six within-reporter covariances among the error terms of indicators were estimated; i.e., the error term for parents' report on one variable was correlated with the error term for their reports on another measure). In the second model, inhibitory control, impulsivity, and persistence were indicators of a behavioral control latent construct, whereas parent- and teacher-rated attentional regulation were indicators of an attentional regulation latent construct (again, the latent constructs were correlated and six within-reporter covariances were estimated). For the measurement model in which effortful control was the latent construct, the model fit well at T1, $\chi^2(7) = 6.58$, $p<.47$, comparative fit index (CFI) = 1.0, root mean square error of approximation (RMSEA) = .00 (90% confidence interval [CI] = .00 to .08), Akaike information criterion (AIC) = 2672.34, and at T2, $\chi^2(7) = 7.98$, $p<.33$, CFI = .998, RMSEA = .027 (90% CI = .00 to .10), AIC = 2435.54. The fit was poor when inhibitory control, impulsivity, and persistence were used as indicators of behavioral control and attentional regulation was a separate latent construct at T1, $\chi^2(7) = 25.29$, $p<.01$, CFI = .975, RMSEA = .11 (90% CI = .07 to .16), AIC = 2691.05, and at T2, $\chi^2(7) = 25.22$, $p<.01$, CFI = .97, RMSEA = .12 (90% CI = .07 to .17), AIC = 2452.79, and the lower AIC for the first model indicates that it is the better model. Thus, the best fit occurred when there was a distinction between the effortful control and impulsivity latent constructs.

In a second set of measurement models, we included all of the hypothesized latent constructs (including problem behaviors, resiliency, and separate constructs for effortful control and impulsivity). However, teachers' reports of internalizing were only modestly correlated with mothers' and fathers' reports of internalizing at T1 and were unrelated to mothers' and fathers' reports at T2 (see Table 2); thus, we tested whether teacher-reported internalizing should be maintained. When teachers' reports were not an indicator of internalizing (and all latent constructs were included in the measurement models), the models fit well at T1, $\chi^2(48) = 57.91$, $p<.15$, CFI = .99, RMSEA = .03 (90% CI = .00 to .06), AIC = 9367.66, and at T2, $\chi^2(46) = 69.83$, $p<.01$, CFI = .98, RMSEA = .05 (90% CI = .02 to .08). When teachers' reports were used as an additional indicator of internalizing problems, the fit was not better at T1 (although we could not use the AIC values or change in chi-square test to compare models including and not including teacher-reported internalizing), $\chi^2(56) = 66.42$, $p<.16$, CFI = .99, RMSEA = .03 (90% CI = .00 to .05), or at T2, $\chi^2(54) = 83.78$, $p<.01$, CFI = .98, RMSEA = .05 (90% CI = .03 to .08). Of particular importance, consistent with some other findings (e.g., Stanger & Lewis, 1993), teachers' reports of internalizing problems at T2 did not load significantly on the internalizing latent construct; thus, it was not a good indicator of the construct. In yet another model, we included teacher-reported internalizing as one latent construct and parent-reported internalizing as a separate construct (along with all the other latent constructs). This model did not fit the data well at either T1, $\chi^2(59, N = 214) = 85.00$, $p<.02$, CFI = .98, RMSEA = .045 (90% CI = .021 to .066), or T2, $\chi^2(59, N = 193) = 110.41$, $p<.001$, CFI = .96, RMSEA = .067 (90% CI = .047 to .086), and father-reported internalizing did not load significantly at T2. Thus, teachers' reports of internalizing were dropped from all subsequent SEM analyses. This decision is consistent with the common notion that teachers are not as good of reporters as are parents of children's internalizing problems (Hinshaw, Han, Erhardt, & Huber, 1992).

Cross-sectional path models—In the hypothesized model, there were paths from effortful control and impulsivity to resiliency, and then from resiliency to internalizing. In addition, there were direct paths from both effortful control and impulsivity to externalizing problems. The latent constructs of effortful control and impulsivity were correlated, as well as the errors

for the latent constructs of internalizing and externalizing problems. In these (and all) models, the errors of the indicators from the same reporter were correlated with each other when needed to converge and as indicated by the modification indexes (Kenny & Kashy, 1992).

The model fit the data well at T1, $\chi^2(52) = 60.02$, $p<.21$, CFI = .99, RMSEA = .03 (90% CI = .00 to .05), and fit fairly well at T2, $\chi^2(55) = 86.85$, $p<.004$, CFI = .974, RMSEA = .055 (90% CI = .031 to .076). In terms of model fitting, the chi-square statistic is affected by sample size; thus, other statistics such as CFI and RMSEA can be used to judge the fit of the model. The path coefficients for the models and R^2s are presented in Figure 2. All observed variables that were not preset to 1 (per standard convention to set the metric of the latent variables) had significant loadings on the expected latent constructs at both T1 and T2. Resiliency was positively predicted by both effortful control and impulsivity, internalizing was negatively predicted by resiliency, and externalizing was negatively predicted by effortful control and positively predicted by impulsivity (the last finding was only marginally significant at T2). The constructs of internalizing and externalizing were positively correlated, whereas impulsivity and effortful control were negatively correlated. Mediated effects were calculated using the procedures outlined by MacKinnon (see MacKinnon, 1994;MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). Resiliency significantly mediated the relations between effortful control and internalizing and between impulsivity and internalizing at T1, *z*s = −4.09 and −3.88, *p*s<.01, and at T2, *z*s = −2.96 and −2.53, *p*s<.01 and .05.

In additional models we added direct paths from effortful and reactive control to internalizing. At both T1 and T2, the fit of the model was not improved and none of these paths was significant.

Finally, although moderation by sex, age, or socioeconomic status was not hypothesized, we computed Box's *M*s (and multigroup models if Box's *M*s were marginally significant) to test for differences in the patterns in the concurrent models for boys and girls, younger (< 73 months, the median) and older children, and higher and lower socioeconomic status families. In these analyses, we excluded fathers' reports of problem behaviors so that we retained most of the children (participants with missing data were excluded). There was no evidence that sex, age, or socioeconomic status moderated the relations in the model.

Moderation by negative emotionality—We first tried to test moderation of the specified paths in the model by anger or sadness using multigroup SEM models (using the multigroup procedures and median splits on anger or sadness). Moderation was not supported in these models. However, these SEM multigroup analyses were undoubtedly low in power because of the number of parameters in the models and because of the dichotomous (rather than continuous) measures of emotion. Thus, we tested the predicted interactions using regression analyses. We first created composites to provide single indicators of effortful control, impulsivity, resiliency, internalizing, and externalizing by summing the weighted scores of measures using the unstandardized weights from the cross-sectional models and dividing by the sum of the weights. In cases of missing data, the weighted scores of valid data were summed and divided by the sum of the valid weights (ensuring that all participants' composite scores were on the same scale). Thus, the composites for effortful control, impulsivity, resiliency, and problem behaviors were weighted in a manner that produced composites comparable to those used in the SEMs. The composites for internalizing and externalizing were transformed to eliminate their positive skewness. Because parents' and teachers' reports of anger and sadness generally were not related (only reports of anger at T1 were significantly correlated), separate regression analyses were computed for teachers' and parents' reports of sadness or anger.

In the regressions, we tested moderation of the relations of effortful control or impulsivity with resiliency or externalizing problems. Anger, but not sadness, was expected to moderate the

direct paths to externalizing problems. Both anger and sadness were examined as separate moderators of relations of effortful control or impulsivity to resiliency. The main effects of effortful control or impulsivity and emotionality (anger or sadness) were entered on the first step and the interaction (multiplicative term) between the two variables was entered on the second step of the regressions. Variables were mean centered and interactions were plotted for the simple slopes for high (1 *SD*), medium (mean level), and low (−1 *SD*) in anger (Aiken & West, 1991).

Neither anger nor sadness moderated the relations of effortful control or impulsivity to resiliency. However, moderation was found when anger and either effortful control or impulsivity were used to predict externalizing problems, but only for teacher-reported anger. Specifically, effortful control and teacher-reported anger interacted when predicting T1or T2 externalizing, *F*s(1, 189; 1, 166) for the R^2 change = 3.78 and .6.44, p = .05 and .02, *B*s for the interaction = −.11 and −.14, change in R^2 = .01 and .02. Effortful control was negatively related to externalizing problems for all levels of anger (and problem behaviors were higher at high levels of anger), but this relation generally was stronger as anger increased, T1 slopes = −.79, −.94, and −1.08, *t*s(189) = −7.19, −11.21, and −9.97 for low, medium, and high anger, *p*s<.01, respectively; T2 slopes = −.51, −.70, and −.89, *t*s(166) = −4.50, −7.83, and −7.65, *p*s<.01. Similarly, impulsivity and T2 teacher-reported anger interacted when predicting T2 externalizing, $F(1, 166)$ for change in R^2 = 5.63, p<.02, B = .15, change in R^2 = .02. Impulsivity was positively related to externalizing problems at all levels of anger, but this relation became stronger as anger scores increased, slopes = .35, .55, and .74, *t*s(166) = 3.30, 6.51, and 5.74 for low, medium, and high anger, *p*s<.01, respectively.

We also examined (a) whether sadness or anger moderated the direct relations of effortful control or impulsivity to internalizing problems, and (b) whether sadness moderated the relations of effortful control or impulsivity to externalizing problems. The 1 significant relation (out of 12) at T2 between effortful control and parent-rated sadness when predicting externalizing problems was considered to be due to chance.

Longitudinal models—To test whether the paths from effortful control and impulsivity to problem behaviors at T2 remained significant after controlling for levels of the constructs at T1, as well as to test the cross-time consistency between these constructs, we constructed a longitudinal model that simultaneously included the T1 and T2 constructs, as well as autoregressive paths and cross-lagged paths between (a) T1 effortful and reactive control and T2 resiliency, and internalizing and externalizing problems, and (b) T1 internalizing and externalizing problems and T2 effortful control and reactive control. Because of our relatively small sample size and the number of variables, composite scores were created as single indicators of each construct. The composite scores were created by summing the weighted scores of measures using the unstandardized weights from the cross-sectional models and dividing by the sum of the weights. In cases of missing data, the weighted scores of valid data were summed and divided by the sum of the valid weights (ensuring that all participants' composite scores were on the same scale). The loadings of the single indicators were fixed at 1 (similar to Sandler, Tein, Mehta, Wolchik, & Ayers, 2000). In addition, the measurement errors of the composite indicators were fixed to the values calculated from the loadings and reliabilities of the individual measures estimated in the cross-sectional models. We tested all cross-sectional and autoregressive paths. In addition, cross-lagged paths were tested (i.e., from T1 problem behaviors to T2 effortful control, impulsivity, and resiliency, and from T1 effortful control, impulsivity, and resiliency to T2 resiliency and problem behaviors).

The hypothesized longitudinal model fit the data well, $\chi^2(12, N = 214) = 22.87$, p<.03, CFI = .99, RMSEA = .065 (90% CI = .02 to .11); the probability of rejecting o the null hypothesis that the RMSEA<.05 was p<.24. However, the modification indexes indicated that a path

should be added from resiliency to externalizing at T1, and doing so significantly improved the model, $\chi^2(11, N = 214) = 13.76$, $p<.25$, CFI = .997, RMSEA = .034 (90% CI = .000 to .084); the probability of rejecting the null hypothesis that the RMSEA<.05 was $p<.64$.; $\Delta\chi^2(1) = 9.11$, $p<.01$. As shown in Figure 3, all of the time-lagged paths (indicating consistency over time) were significant and positive. The T1 paths were significant in the expected direction. Moreover, the T2 paths were all significant, with the exception of the path from impulsivity to externalizing, which dropped to nonsignificance. In addition, there were negative paths from T1 externalizing to T2 effortful control and from T1 internalizing to T2 resiliency. Based on McKinnon's (1994) formula for mediation, T1 resiliency significantly mediated the relations between effortful control and internalizing or externalizing, zs = −5.37 and −2.87, ps<.01, and between impulsivity and internalizing or externalizing, zs = −5.02 and −2.81, ps<.01. After including for the time-lagged effects of the corresponding T1 constructs, T2 resiliency significantly mediated the relations between effortful control and internalizing ($z = -2.67$, $p<.01$), whereas mediation by resiliency of the relation between impulsivity and internalizing was marginally significant, $z = -1.79$, $p<.08$.

In a final longitudinal model, we examined the nature of cross-time effects between the variables in the longitudinal model. All of the latent constructs at T1 were intercorrelated (there were no within-time paths at T1 or T2), autoregressive paths were included from T1 to T2, and the cross-lagged paths in the aforementioned longitudinal model were included. A model of this sort is a stronger test of cross-lagged relations than one in which there are concurrent (within-time) paths that are directional. Correlations between the errors of latent construct at T2 (equivalent to correlating the constructs) were added as requested by modification indexes (seven correlations were added). This model fit the data well, $\chi^2(9, N = 214) = 10.59$, $p<.30$, CFI = .999, RMSEA = .03 (90% CI = .000 to .085); the probability of rejecting the null hypothesis that the RMSEA<.05 was $p<.67$ (see Figure 4). In these longitudinal models, all standardized paths were less than 1.0. There were significant cross-lagged paths from T1 effortful control to lower levels of T2 externalizing problems and higher levels of T2 resiliency; in addition, externalizing problem behaviors at T1 predicted low levels of effortful control at T2, whereas T1 internalizing problems predicted low resiliency at T2. Thus, there was evidence of bidirectionality of the relations over time.

Because the regular maximum likelihood estimation in Mplus assumes multivariate normality, we also tested all SEMs with the new option in Mplus 2.1, which provided standard errors and a chi-square statistic for missing data with non-normal outcomes by using a sandwich estimator and the Yuan-Bentler T_2^* test statistic (Muthen & Muthen, 2002). The fits of the models changed little. There was only one path that changed in the longitudinal models (both the model containing concurrent and cross-lagged paths and the cross-lagged only model); the path from externalizing at T1 to effortful control at T2 became nonsignificant. Thus, it appears that multivariate non-normality (if existed in the data) had a minimal effect on the SEM results.

Discussion

The results of this study are informative regarding several important issues. First, we found that effortful control and impulsivity provided unique prediction of resiliency and problem behaviors at two ages and that this prediction (except for the path from impulsivity to externalizing problems at T2) held in mid- to late-elementary school, even when the variance due to the across-time consistency of the variables was taken into account. Thus, the relations of effortful control and impulsivity to resiliency and adjustment at the second assessment were not merely due to the consistency in the variables (and their interrelations) from the early preschool and school years. It also appears that individual differences in effortful control did not fully account for the relation of impulsivity to resiliency but may have contributed to the reduced relation between impulsivity and externalizing problems over time. Although the

unique relations of effortful control and ego control (as an index of reactive control) have been examined, this is, to our knowledge, the first test of the unique relations of effortful control and impulsivity to externalizing problems. The findings suggest that the contributions of temperamental processes such as effortful and reactive control to adjustment are more multifaceted and complex than has been acknowledged.

To our knowledge, this also is the first time that effortful control and impulsivity (or any other measure of reactive control) have been shown to have unique relations to internalizing problems. Moreover, these relations were mediated by resiliency (but not moderated by anger or sadness). Thus, children who were low in effortful control or impulsivity tended to be low in resiliency (regardless of their level of negative emotionality), which in turn predicted low levels of internalizing problems (this relation was only marginally significant at T2 for impulsivity). Children who are low in impulsivity may lack the spontaneity needed to test new ways of dealing with stressful circumstances. Moreover, children who are low in effortful control may have difficulties managing their negative emotional states (e.g., shifting attention to other thoughts or focusing on positive thoughts) and, as a consequence, find it difficult to rebound from negative experiences. Although causality cannot be determined, it is possible that early temperamentally based differences in both effortful control and impulsivity contribute to the development of resiliency and reduce the risk of concurrent and later internalizing symptoms. Nonetheless, because effortful control involves voluntary processes, it is likely that despite the biological bases of effortful control, children can learn methods of modulating their attention and behavior that can reduce internalizing symptoms through enhancing resiliency.

In contrast to the findings for internalizing problems, impulsivity and low effortful control usually were directly related to children's externalizing problems. Although scores for externalizing problems tended to be negatively correlated with resiliency, resiliency did not mediate the associations between effortful control or impulsivity and externalizing problems (i.e., the modification indexes did not indicate that adding paths from effortful control or externalizing to resiliency would improve the models) except at T1 in the longitudinal model only (but not in concurrent models). This pattern of findings is consistent with prior work in which attentional and behavioral control/regulation were both directly related to externalizing problems (and their effects were not mediated by resiliency; Eisenberg, Guthrie, et al., 2000). The pattern of findings (including those for moderation by anger) suggests that efforts to reduce externalizing problems should include procedures designed to refocus attention on internal or external stimuli that lower arousal or to inhibit behavior when one is frustrated or angered.

The pattern of findings is also consistent with the notion that effortful control and impulsivity are not simply tapping that same construct—that they reflect different, albeit correlated, aspects of functioning. Reactive control (especially when assessed with other reports or actual behavior) likely reflects the degree to which reactive motivational systems such as the approach system and the fear or anxiety systems are overtly experienced and then expressed rather than willfully modulated or masked through effortful control (see Derryberry & Rothbart, 1997; Gray & McNaughton, 2000). We predicted that with age, as children's effortful control increases (e.g., Murphy, Eisenberg, Fabes, Shepard, & Guthrie 1999), the unique effects of impulsivity decrease, and there was some support for this notion. As already noted, in the T2 concurrent model, the path from impulsivity to externalizing problems was only marginally significant and the same path was nonsignificant in the longitudinal model (whereas the analogous paths from effortful control to externalizing were significant). An important question to address in the future is whether relations of impulsivity to adjustment become weaker in adolescence as effortful control is increasingly used to control the overt behavioral tendencies (if not the motivational urges) associated with reactive tendencies.

There also was mixed evidence of bidirectional relations between effortful control and externalizing problems; in the model in which only autoregressive and cross-lagged paths were included, T1 externalizing problems predicted T2 effortful control whereas T1 effortful control predicted T2 externalizing problems. However, in the robust longitudinal models, the path from T1 externalizing to T2 effortful control was not significant, suggesting that directionality may be more from effortful control to externalizing. It also appeared that T1 internalizing behavior (which was predicted by T1 resiliency in the longitudinal model with concurrent paths) predicted T2 resiliency; therefore, there was a suggestion of bidirectional effects for these two variables also. In contrast, there was no evidence of bidirectional effects involving impulsivity. Thus, the strongest pattern of relations was from effortful control and impulsivity to adjustment (often through resiliency), although measures of adjustment may also have had some effects on later effortful control and resiliency.

The relations of effortful control and impulsivity to externalizing problems sometimes were moderated by children's dispositional anger, such that these relations were stronger for children who were relatively high in teacher-reported anger. Thus, for children prone to anger, regulation was a better (negative) predictor of externalizing problems. This moderating effect was found despite some moderate correlations between reports of anger with effortful control or impulsivity (although correlations between these constructs were never higher than an absolute value of .55). For children low in anger, effortful control simply may be less necessary for behaving appropriately. It is unclear why moderation was found only for teacher-reported, and not parent-reported, anger; perhaps children's anger displays outside the home are more indicative than anger expressions at home of children's general tendencies to express inappropriate emotion and, consequently, the importance of effortful control and impulsivity in predicting their adjustment. Children who tend to express anger at home but not at school may be high in effortful control but simply select when and where it is most useful and fruitful to express anger. Alternatively, mothers' reports of their children's anger may be based to a greater degree than are those of teachers on subtle cues of anger (because of their greater attention to, and knowledge of, their children's anger expressions), and children's milder or better controlled anger may have fewer implications for links between regulation and children's externalizing problems. In any case, the moderational findings suggest that children who are prone to anger may benefit more than other children from interventions that promote effortful control.

The fact that sadness generally did not moderate relations of impulsivity or effortful control to externalizing problems supports the notion that sadness does not play as central (or perhaps as complex) a role in externalizing problems as does anger. This does not mean that children with externalizing problems often are not sad; they may be sad because of peer rejection (Rubin et al., 1998) or other factors. Indeed, at T1, children with borderline or clinical levels of externalizing problems (pure or comorbid) tended to be rated as sadder (and angrier) than control children (Eisenberg, Cumberland, et al., 2001). However, sadness did not set boundary conditions that modified the relation of regulation or impulsivity to externalizing problems. Moreover, the overall pattern of findings is consistent with the conclusion that it is prudent to differentiate among different types of negative emotions when examining interactions between regulation or control and negative emotions.

Another finding of conceptual interest was that the fit of the measurement model was better when the latent constructs of effortful control (including attentional regulation, inhibitory control, and observed persistence) and impulsivity were differentiated than when separate latent constructs of attentional regulation and behavioral regulation (including inhibitory control, impulsivity, and observed persistence) were used. Separating impulsivity from inhibitory control is consistent with recent conceptual writings in which inhibitory control is believed to reflect effortful control and impulsivity is believed to reflect reactive processes

(Derryberry & Rothbart, 1997; Eisenberg & Morris, 2002). Some differences in the findings in this study and past research, such as the lack of a relation of behavioral control to resiliency in prior work (e.g., Eisenberg, Guthrie, et al., 2000), might have been due to failure to distinguish between effortful and reactive control.

Impulsivity generally was not consistently related to internalizing problems in the correlations (and the modification indexes did not call for a direct path from impulsivity to internalizing problems in the SEM). At first glance, this may seem surprising because more severe internalizing problems have been linked to low impulsivity, even in this sample at T1 (Eisenberg, Cumberland, et al., 2001). However, internalizing problems tend to be at least moderately correlated with externalizing problems, and children who are prone to externalizing problems often are high in impulsivity. Indeed, when mother, father, or teacher internalizing scores were correlated with concurrent parent- or teacher-rated impulsivity when partialing out a given reporter's scores of externalizing, 8 of the 12 partial correlations were negative and significant (and another was marginally significant). Thus, the relation between internalizing problems and low impulsivity is evident only when internalizing problems are pure (not comorbid).

Strengths of this study include the use of multiple reporters and measures, the longitudinal design, and the use of SEMs (which can test various paths simultaneously and correct for error) to test the predicted model. However, although the sample was relatively diverse, it did not include a large number of any single minority group; therefore, the findings may not generalize to all minority groups in the United States (or other cultures). Moreover, although a number of the participating families had modest incomes, the sample did not include large numbers of children living in very high risk neighborhoods. In future work, it will be important to assess whether the distinction between impulsivity and effortful control provides prediction in high-risk or minority samples, or both.

Finally, because the study involved correlational data, it is impossible to know if any of the obtained relations are causal. It is possible that individual differences in effortful control, impulsivity, resiliency, or problem behaviors are all caused by some other factor(s) and that effortful control and impulsivity do not have causal effects on resiliency and problem behaviors. Moreover, it is possible that children's adjustment has some sort of effect on their effortful control, impulsivity, or resiliency. Nonetheless, because of the constitutional basis of emotionality and emotion-related regulation (e.g., Goldsmith, Buss, & Lemery, 1997; Plomin & Stocker, 1989), and the later emergence of problem behaviors than temperament, adjustment seems less likely to have a causal effect on negative emotionality, impulsivity, and effortful control than vice versa.

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Figure 1.
Model of hypothesized relations of effortful control, impulsivity, and resiliency to internalizing and externalizing problems. Effort = effortful control; implsv = impulsivity; resil = ″′ resiliency; intern = internalizing problems; extern = externalizing problems.

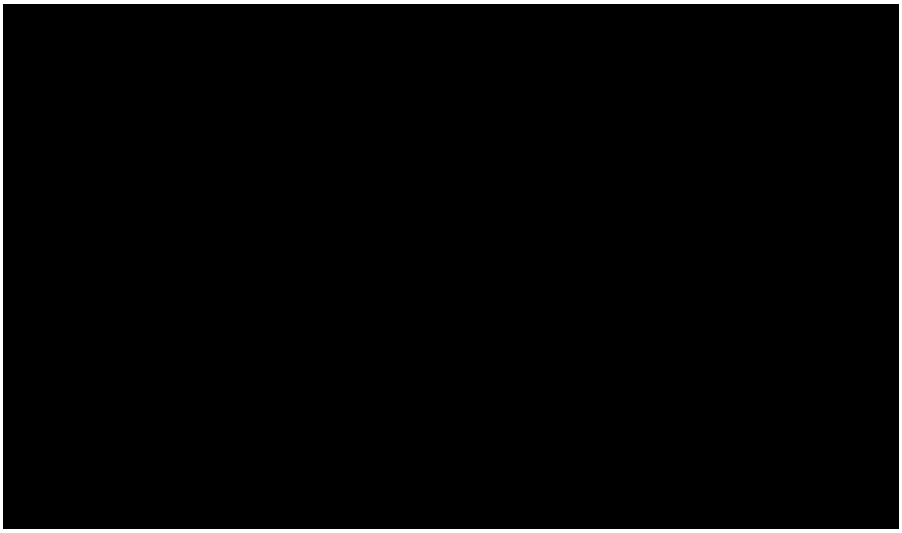

Figure 2.

Cross-sectional models with unstandardized measurement and parameter estimates. Estimates are in parentheses. Effort = effortful control; Implsv = impulsivity; Resil = resiliency; Intern = internalizing problems; Extern = externalizing problems; Persist = persistence on puzzle task; Tinhib = teacher inhibitory control; Pinhib = parent inhibitory control; Tattreg = teacher attention regulation; Pattreg = parent attention regulation; Timplv = teacher impulsivity; Pimplv = parent impulsivity; Presil = parent resiliency; Tresil = teacher resiliency; Mintern = mother internalizing problems; Dintern = father internalizing problems; Mextern = mother externalizing problems; Textern = teacher externalizing problems; Dextern = father externalizing problems. Time 1: $\chi^2(52, N = 214) = 60.02$; $p<.21$, comparative fit index (CFI) = .994, root mean square error (RMSEA) = .03; Time 2: $\chi^2(55, N = 193) = 86.85$, $p<.00$, CFI = .97, RMSEA = .06. Bold lines represent mediated paths.

Figure 3.

Longitudinal panel model with unstandardized measurement and parameter estimates. Effort-1 = effortful control at Time 1; Implsv-1 = impulsivity at Time 1; Resil-1 = resiliency at Time 1; Int-1 = internalizing problems at Time 1; Ext-1 = externalizing problems at Time 1; Effort-2 = effortful control at Time 2; Implsv-2 = impulsivity at Time 2; Resil-2 = resiliency at Time 2; Int-2 = internalizing problems at Time 2; Ext-2 = externalizing problems at Time 2; $\chi^2(11, N = 214) = 13.76$, $p<.24$, comparative fit index (CFI) = .98, root mean square error (RMSEA) = .03. Only significant cross-lagged paths are presented in this figure; refer to the text for a list of cross-lagged paths that were included in the model. Bold lines represent mediated paths.

Figure 4.
Longitudinal model with across-time bidirectional paths: Unstandardized measurement and parameter estimates. Effort-1 = effortful control at Time 1; Implsv-1 = impulsivity at Time 1; Resil-1 = resiliency at Time 1; Int-1 = internalizing problems at Time 1; Ext-1 = externalizing problems at Time 1; Effort-2 = effortful control at Time 2; Implsv-2 = impulsivity at Time 2; Resil-2 = resiliency at Time 2; Int-2 = internalizing problems at Time 2; Ext-2 = externalizing problems at Time 2; $\chi^2(9, N = 214) = 10.59$, $p<.30$, comparative fit index (CFI) = 1.0, root mean square error (RMSEA) = .03. Only significant cross-lagged paths are presented in this figure.

Table 1

Means and Standard Deviations of Study Variables by Child's Sex

Variable	Total		Girls		Boys	
	M	SD	M	SD	M	SD
Mother ratings T1						
Inhibitory control (*n* = 209)	4.59	0.90	4.84	0.67	4.38	0.99
Attentional regulation (*n* = 209)	4.33	0.72	4.48	0.62	4.21	0.78
Impulsivity (*n* = 209)	4.55	0.84	4.43	0.87	4.64	0.79
Resiliency (*n* = 211)	6.14	1.25	6.09	1.26	6.18	1.24
Internalizing problems (*n* = 209)	9.70	6.62	9.34	5.68	10.00	7.32
Externalizing problems (*n* = 209)	15.33	9.08	13.71	7.73	16.68	9.90
Anger (*n* = 209)	4.81	0.87	4.73	0.83	4.88	0.91
Sadness (*n* = 209)	4.41	0.76	4.53	0.83	4.31	0.69
Father ratings T1						
Internalizing problems (*n* = 116)	7.05	6.70	8.23	7.11	6.33	6.39
Externalizing problems (*n* = 116)	11.72	8.14	9.96	6.34	12.81	8.92
Teacher ratings T1						
Inhibitory control (*n* = 195)	5.03	1.07	5.36	0.91	4.73	1.12
Attentional regulation (*n* = 195)	4.82	1.04	5.03	1.01	4.64	1.03
Impulsivity (*n* = 194)	4.12	1.16	3.91	1.04	4.30	1.24
Resiliency (*n* = 193)	6.55	1.36	6.53	1.31	6.57	1.41
Externalizing problems (*n* = 194)	8.32	10.32	5.86	8.37	10.45	11.37
Anger (*n* = 193)	3.82	1.29	3.61	1.22	3.99	1.33
Sadness (*n* = 180)	3.58	0.88	3.69	0.86	3.49	0.89
Observed persistence (*n* = 212)	0.55	0.30	0.62	0.28	0.49	0.30
Mother ratings T2						
Inhibitory control (*n* = 185)	4.77	0.89	4.90	0.75	4.65	0.98
Attentional regulation (*n* = 184)	4.42	0.76	4.51	0.71	4.34	0.79
Impulsivity (n = 183)	4.43	0.84	4.25	0.87	4.57	0.79
Resiliency (*n* = 185)	6.18	1.25	6.20	1.24	6.16	1.25
Internalizing problems (*n* = 192)	8.66	9.78	8.91	7.00	8.45	6.62
Externalizing problems (*n* = 192)	12.58	7.79	11.52	6.79	13.46	8.47
Anger (*n* = 183)	4.58	0.90	4.59	0.90	4.58	0.90
Sadness (*n* = 183)	4.30	0.81	4.51	0.82	4.13	0.76
Father ratings T2						
Internalizing problems (*n* = 115)	6.17	6.07	6.57	6.52	5.78	5.63
Externalizing problems (*n* = 115)	9.48	6.04	8.70	4.89	10.22	6.93
Teacher ratings T2						
Inhibitory control (*n* = 178)	4.90	1.18	5.30	1.08	4.54	1.15
Attentional regulation (*n* = 180)	4.78	1.02	5.06	0.92	4.53	1.04
Impulsivity (*n* = 177)	4.12	1.04	3.91	1.04	4.32	1.01
Resiliency (*n* = 178)	6.54	1.46	6.72	1.37	6.38	1.52
Externalizing problems (*n* = 180)	9.11	11.51	6.40	8.67	11.53	13.13
Anger (*n* = 170)	3.67	1.32	3.43	1.29	3.89	1.31
Sadness (*n* = 169)	3.68	0.99	3.72	0.93	3.64	1.05
Observed persistence (*n* = 174)	0.69	0.29	0.72	0.28	0.66	0.30

Note. T1 = Time 1; T2 = Time 2.

Table 2

Correlations Among Mother, Father, and Teacher Reports of Problem Behaviors at Time 1 (T1) and Time 2 (T2)

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Mother externalizing T1											
2. Mother internalizing T1	.53**										
3. Father externalizing T1	.57**	.33**									
4. Father internalizing T1	.31**	.59**	.49**								
5. Teacher externalizing T1	.45**	.18*	.27**	.21*							
6. Teacher internalizing T1	.19*	.17*	.04	.23*	.46**						
7. Mother externalizing T2	.71**	.41**	.50**	.34**	.37**	.13+					
8. Mother internalizing T2	.41**	.64**	.27**	.58**	.13+	.21**	.60**				
9. Father externalizing T2	.33**	.09	.52**	.29**	.24*	.04	.44**	.28**			
10. Father internalizing T2	.17+	.39**	.26*	.69**	.15	.23*	.35**	.50**	.57**		
11. Teacher externalizing T2	.33**	−.06	.31**	−.09	.48**	.03	.29**	−.04	.30**	−.02	
12. Teacher internalizing T2	.03	−.02	.05	.02	.26**	.12	−.03	−.10	.13	.07	.50**

+ $p < .10$.

* $p < .05$.

** $p < .01$.

Table 3

Correlations Among Parent and Teacher Reports of Regulation, Impulsivity, and Resiliency, and Observed Persistence at Time 1 (T1) and Time 2 (T2)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Parent inhib contl T1																	
2. Parent atten reg T1	.81**																
3. Parent impuls T1	−.53**	−.40**															
4. Parent resil T1	.15*	.30**	.17*														
5. Teacher inhib contl T1	.50**	.46**	−.32**	.17*													
6. Teacher atten reg T1	.44**	.41**	−.29**	.17*	.86**												
7. Teacher impuls T1	−41**	−.31**	.47**	−.04	−.61**	−.48**											
8. Teacher resil T1	.06	+.14	.14*	+.13	.27**	.42**	.21**										
9. Persistence T1	.25**	.27**	+−.13	.02	.22**	.24**	−.10	.14*									
10. Parent inhib contl T2	.79**	.67**	−.52**	+.13	.40**	.33**	−.30**	−.04	.16*								
11. Parent atten reg T2	.65**	.70**	−.39**	.24**	.36**	.36**	−.21**	.09	.18*	.78**							
12. Parent impuls T2	−.50**	−.41**	.77**	+.13	−.33**	−.25**	.47**	.15*	−.09	−.56**	−.48**						
13. Parent resil T2	.21**	.30**	.12	.53**	.24**	+.15	−.05	.11	.09	.27**	.40**	.06					
14. Teacher inhib con T2	.47**	.41**	−.43**	−.10	.57**	.49**	−.48**	.01	.22**	.43**	.36**	−.37**	.06				
15. Teacher atten reg T2	.40**	.31**	−.33**	−.08	.52**	.46**	−.37**	−.01	.20**	.40**	.31**	−.26**	.07	.85**			
16. Teacher impuls T2	−.27**	−.22**	.50**	+.13	−.42**	−.30**	.57**	+.14	−.19*	−.26**	−.17*	.50**	.08	−.52**	−.29**		
17. Teacher resil T2	.12	.03	−.03	−.10	.31**	.32**	−.02	.26**	.08	.10	.03	.08	.07	.45**	.58**	+.14	
18. Persistence T2	.14+	.10	−.23**	+−.13	.18*	.19*	+−.15	.05	.37**	.09	.09	−.11	−.12	.23**	.21**	−15*	.16*

Note. Atten reg = attentional regulation; inhib contl = inhibitory control; impuls = impulsivity; resil = resiliency.

+ $p < .10$.

* $p < .05$.

** $p < .01$.

Table 4

Correlations Between Adult Reports of Problem Behaviors and Adult Reports of Regulation, Impulsivity, and Resiliency, and Observed Persistence at Time 1 (T1) and Time 2 (T2)

Variable	Mother intern T1	Mother extern T1	Father intern T1	Father extern T1	Teacher intern T1	Teacher extern T1	Mother intern T2	Mother extern T2	Father intern T2	Father extern T2	Teacher intern T2	Teacher extern T2
1.Parent inhib control T1	−.28**	−.62**	−.21*	−.44**	−.19**	−.49**	−.21**	−.49**	−.12	−.23*	−.06	−.31**
2.Parent atten reg T1	−.30**	−.56**	−.23*	−.36**	−.18*	−.38**	−.24**	−.45**	−.16+	−.23*	−.01	−.27**
3.Parent impuls T1	−.04	.46**	.01	.35**	.07	.40**	−.07	.29**	−.08	.14	.10	.46**
4.Parent resil T1	−.47**	−.23**	−.27**	−.16+	−.13+	−.07	−.39**	−.23**	−.24*	−.04	.12	.115
5. Teacher inhib control T1	−.21**	−.45**	−.18+	−.34**	−.28**	−.72**	−.16*	−.38**	−.19+	−.33**	−.20**	−.41**
6.Teacher atten reg T1	−.19*	−.42**	−.15	−.27**	−.34**	−.65**	−.10	−.30**	−.12	−.27**	−.19*	−.33**
7.Teacher impuls T1	.12	.40**	.10	.15	−.00	.67**	.03	.26**	.09	.16+	.11	.44**
8.Teacher resil T1	−.11	−.07	−.08	.05	−.51**	−.17*	−.14+	−.06	−.03	−.01	−.15+	.03
9.Persistence T1	−.03	−.23**	−.01	−.16+	−.03	−.14+	.04	−.10	−.07	−.09	−.13+	−.20**
10.Parent inhib control T2	−.20**	−.51**	−.18+	−.42**	−.12	−.41**	−.25**	−.46**	−.14	−.29**	−.06	−.30***
11.Parent atten reg T2	−.21**	−.45**	−.12	−.25*	−.11	−.33**	−.32**	−.44**	−.20*	−.26**	−.05	−.19**
12.Parent impuls T2	.00	.40**	−.08	.25*	−.01	.35**	−.02	.31**	−.01	.20*	−.02	.36**
13.Parent resil T2	−.45**	−.22**	−.35**	−.05	−.22**	−.15+	−.56**	−.27**	−.40**	−.17+	−.08	.05
14.Teacher inhib control T2	−.04	−.32**	−.17	−.30**	−.11	−.54**	−.05	−.30**	−.13	−.37**	−.36**	−.69**
15.Teacher atten reg T2	−.03	−.22**	−.05	−.26*	−.10	−.44**	−.02	−.23**	−.07	−.26**	−.46**	−.61**
16.Teacher impuls T2	−.11	.34**	.00	.30**	−.06	.46**	−.00	.30**	.04	.34**	.01	.54**
17.Teacher resil T2	−.10	−.05	−.12	−.13	−.21**	−.29**	−.02	−.02	−.01	−.06	−.60**	−.34**
18.Persistence T2	.20**	−.06	.21*	.11	−.05	−.18*	.16*	.07	.14	−.02	−.18*	−.22**

Note. Intern = internalizing problems; extern = externalizing problems; inhib control = inhibitory control; atten reg = attentional regulation; impuls = impulsivity; resil = resiliency.

+ $p<.10$.

* $p<.05$.

** $p<.01$.