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From Parent to Child to Parent…: Paths In and Out of Problem Behavior

Robert H. Bradley and
Family & Human Dynamics Research Institute, Arizona State University

Robert Corwyn
Department of Psychology, University of Arkansas at Little Rock

Abstract

This study used data from the NICHD Study of Early Child Care and Youth Development to examine relations between parenting, self-control and externalizing behavior from early childhood to mid-adolescence (N=956; 49.9% male). Results indicated that maternal sensitivity, parental harshness and productive activity are related to externalizing problems but that patterns of relations change from early childhood to middle childhood to adolescence, with evidence suggesting that externalizing behavior influences parenting more than the reverse from middle childhood onward. Self-control measured during early adolescence partially mediated relations between maternal sensitivity and adolescent-reported externalizing behavior. Parental monitoring during adolescence was also related to externalizing behavior at age 15. Monitoring partially mediated the relation between externalizing behavior in early adolescence and externalizing at age 15.

Keywords

parenting; home learning environment; externalizing behavior; maternal sensitivity; harshness; self-control; monitoring

Externalizing behavior is common during adolescence (Dishion & Patterson, 2006; Frick & Viding, 2009). For a number of children, the hostile, non-compliant behavior patterns manifest during adolescence persist, sometimes taking more damaging forms during adulthood (Lynam, Caspi, Moffitt, Loeber, & Stouthamer-Loeber, 2007). Considerable attention has been given to identifying processes that influence the course of development for externalizing problems (Hinshaw, 2002; Lynam et al., 2007). It is a challenging task because there are normative shifts in the form externalizing behavior takes and because multiple forms of externalizing behavior can be co-morbid in the same individual. It is also challenging because researchers have identified a number of mechanisms that may be implicated in the emergence and maintenance of externalizing problems (Ary, Duncan, Giglan, Metzler, Noell, & Smolkowski, 1999; Hinshaw, 2002). According to Dishion and Patterson (2006), the mechanisms that account for change in antisocial behavior may vary

Correspondence concerning this article should be addressed to Robert H. Bradley, Family and Human Dynamics Research Institute, Arizona State University, 951 S. Cady Mall, Tempe, AZ 85287, robert.bradley@asu.edu.

from one stage of development to the next. Even so, these distinct conditions or forms of externalizing behavior appear to share some of the same risk factors and mediators (Lahey et al., 1999; Pardini, Lochman, & Powell, 2007).

The focus of this follow-up study is on three aspects of parenting (providing opportunity for productive activity, maternal sensitivity, and harsh parenting) from early childhood through adolescence and how these aspects of experience may be implicated in externalizing behavior at age 15. We also consider one pathway linking parenting to externalizing behavior (adolescent self-control) that was shown to be significant at age 7 and again at age 11 (Bradley & Corwyn, 2005, 2007). Simons, Simons, Chen, Brody, and Lin (2007) identify self-control as a mediator of parenting connected to antisocial behavior in children. According to the social interaction perspective outlined by Dishion and Patterson (2006), self-regulation is highly embedded in the relationship dynamics connected with externalizing behavior; so, in some fashion, it constitutes a unifying process in what can be an evolving set of contextual influences and maladaptive actions. We also consider a new parenting process (monitoring), as there is a growing literature on the potential significance of parental monitoring as a means of preventing behavior problems (Lac & Crano, 2009). More specifically, we look at cross-time reciprocal paths between parenting and externalizing across three developmental periods. Examining bi-directional associations is consistent with prevailing views pertaining to reciprocal interplay between parenting and maladaptive behavior (Dishion & Patterson, 2006; Gershoff, Lansford, Sexton, Davis-Kean, & Sameroff, 2012; Williams & Steinberg, 2011). By looking at the interplay from early childhood onward, this study goes beyond the time frames considered in most prior studies of adolescent externalizing problems (Hipwell, Kennan, Kasza, Loeber, Stouthamer-Loeber, & Bean, 2008; Pardini, Fite, & Burke, 2008; Stice & Barrera, 1995). It would seem to serve as a complement to the few studies that have examined reciprocal relations between parenting and externalizing problems, given that most have considered only a single parenting process rather than simultaneously considering several processes that function together to affect developmental course.

Adolescence is characterized by adjustments in most areas of development and human relationships, particularly in matters connected to autonomy (Eccles et al., 1993; Gutman & Eccles, 2007). Adolescents are more likely to select and fashion the environments where they spend time and exercise judgment with respect to what they attend to (Scarr & McCartney, 1983). This suggests a likely diminishment of parental influence on children's behavior. Pardini et al. (2008) offer evidence in support of some waning of parental influence on conduct problems during adolescence. They found a reduction of impact both for physical punishment and for certain positive aspects of parenting. This has particular significance as applied to self-regulation, one of the central processes involved in externalizing behavior (Rothbaum & Weisz, 1994).

Somewhat by contrast, there is little to suggest that parental behavior is less amenable to change as children grow older. Indeed, the dialectical theory of social relationships suggests something of the opposite (Kuczynski, Pitman, & Mitchell, 2009); that is, parents are likely to continue to reformulate their approach to child management in response to the child's changing needs and proclivities. As children age, parents continue to appraise how much a

particular behavior will assist in the accomplishment of child or family goals and resist threats to their own autonomy (Kuczynski et al., 2009). In the paragraphs that follow we consider what is known about reciprocal relations between externalizing behavior and the parenting processes to be examined.

Greater attention has been given to relations between parental harshness and externalizing behavior than to most parenting processes, with evidence suggesting that harsh treatment increases the likelihood children will engage in behavior problems and that high levels of behavior problems increase the likelihood parents will engage in harsh forms of behavior control (Gershoff et al., 2012; Dishion & Patterson, 2008; Larsson, Viding, Fijsdijk, & Plomin, 2008; Pardini et al., 2008). Less clear is whether the use of physical discipline, short of maltreatment, with adolescents increases the risk adolescents will engage in antisocial behavior (Lansford et al., 2009; Jaffee, Caspi, Moffitt, & Taylor, 2004; Pardini et al., 2008). The evidence is more compelling about an association between harsh punishment and externalizing behavior during middle childhood (Hipwell et al., 2008). Even so, punishment during middle childhood may not lead to an increase in externalizing problems between middle childhood and adolescence if other parenting practices are controlled. Unfortunately, most studies of discipline have not simultaneously controlled other aspects of parenting, leaving unclear whether physical punishment itself accounts for the often observed positive relation between harshness and externalizing behavior (Deater-Deckard & Dodge, 1997; Hipwell et al., 2008). In sum, in a model that accounts for positive aspects of adolescents' home experience, it seems likely that parental harshness will be associated with more externalizing behavior – if only modestly. That granted, it seems likely that the relation will be more pronounced during early and middle childhood than during adolescence.

Relatively little is known about reciprocal relations between parental sensitivity and externalizing behavior. There are reasons to hypothesize that externalizing behavior at age 15 would be associated with maternal sensitivity, as we observed at age 11 (Bradley & Corwyn, 2007). For example, there is evidence that the quality of relationships between adolescents and their parents is associated with delinquent and antisocial behavior (Gutman & Eccles, 2007; Stice & Barrera, 1995; Simons et al., 2007). Parental sensitivity helps foster a sense of closeness and sustained identification with adult prosocial values and to promote self-control (Rothbaum & Weisz, 1994; Vieno, Nation, Pastore, & Santinello, 2008). Insensitive parents often use psychological control, which appears to foster externalizing behavior (Soenens & Vanstreenkiste, 2010). Attachment theory suggests that parental sensitivity earlier in the life course may have a continued connection to behavioral adjustment during adolescence even controlling for parental behavior that occurs during adolescence, as it establishes a framework for self-regulation, positive social relationships and productive pursuits over the life course (Guttmann-Steinmetz & Crowell, 2006). Likewise, self-determination theory suggests that continued sensitive and productive engagement with children at all points in development should foster self-regulation (Joussemet, Landry, & Koestner, 2008).

By contrast, externalizing behavior on the part of a child may degrade parent-child relationships, causing parents to disengage from their children (Dishion, Nelson, & Bullock, 2004; Pardini et al., 2008). Coping with a child's aggression and non-compliance leads to

parental stress, and this increased stress can result in lower sensitivity and greater efforts to control the child's behavior on the part of the parents (Larsson et al., 2008; Moffitt, 1993; Pardini et al., 2008; Williford, Calkins, & Keane, 2007).

In our prior study, opportunity for productive activity during middle childhood was related to fewer externalizing problems at 5th grade (Bradley & Corwyn, 2007). Motivated action theory stipulates that exposure to rich and challenging situations tends to foster sensitivity to environmental affordances and demands, thus, promoting controlled strategies aimed at goal attainment (DeShon & Gillespie, 2003). It enables adolescents to narrow their sphere of actions and to make thoughtful choices about those actions (Carver & Scheier, 2002). According to self-determination theory, self-regulation emerges as a byproduct of engaging in intrinsically motivated activities (Moller & Deci, 2010). When adolescents have few outlets for goal attainment or the construction of productive new goals, they are more likely to act in self-defeating ways, which may include engagement in antisocial behavior (Skinner, Johnson, & Snyder, 2005). That said, as children move deeper into adolescence, there may be something of a developmental shift as regards the most critical venues for engaging in productive activity. Although the likelihood adolescents will engage in purposeful extracurricular activity and community organizations is increased when they have a positive home life, it may be productive activity outside the home more so than productive activity in the home that promotes adaptive behavior during adolescence (Lerner et al., 2005).

In previous studies we examined the same three aspects of parenting considered in this follow-up study, namely, maternal sensitivity, parental harshness, and opportunity for productive activity. In this study, we consider a fourth aspect, monitoring, due to increased evidence of its relations with risky behavior (Dishion et al., 2004; Lac & Crano, 2009; Laird, Pettit, Bates & Dodge, 2003; Pardini et al., 2008). Findings pertaining to parental monitoring and adolescent externalizing behavior are not fully consistent. Evidence points to a negative relation between parental knowledge of children's activities and whereabouts and externalizing behavior with other evidence indicating that when children engage in high levels of risky behaviors parents tend to reduce their level of monitoring (Dishion et al., 2004; Laird et al., 2003). Precisely what this represents remains unclear. Part of the protective “effect” of monitoring may derive from the fact that monitoring is part of a larger repertoire of parental actions aimed at maintaining connection with the child (Anderson & Branstetter, 2012; Rothbaum & Weisz, 1994). More specifically for our study, there is reason to believe that adolescents' involvement in productive activity connected to home life (some of which occurs with parents) may foster reciprocal communications plus increase opportunities for parents to monitor and guide adolescents (Anderson & Branstetter, 2012).

We found that 11-year olds who experienced greater opportunity for productive activity, higher maternal sensitivity, and less harsh punishment engaged in fewer externalizing behavior (Bradley & Corwyn, 2007). A common pathway was through self-control. Many of the same findings seem likely to emerge at age 15, especially those pertaining to maternal sensitivity. During adolescence, self-regulation appears to function as a kind of resilience factor, enabling adolescents to resist peer pressure (Gardner, Dishion, & Connell, 2008). More generally, self-regulation is conceived as a multi-layered set of processes that involve

both cognitive and affective components in the service of adaptive behavioral management (Cervone, Shandel, Smith, & Fiori, 2006).

In overview, we anticipate that reciprocal patterns of relations will emerge between externalizing behavior and the three aspects of parenting we observed from infancy through adolescence, but that the impact of parenting processes on externalizing behavior will diminish as children age. We expect to see a kind of cumulative effect with externalizing behavior becoming increasingly stable. That granted, consistent with attachment and self-determination theory, we expect that maternal sensitivity during early and middle childhood will continue to exert an influence on externalizing behavior at age 15 via self-control – an alternative to the idea of a simple cumulative effect. A goal of this study is to examine such alternatives. Furthermore, we anticipate that self-control will serve to mediate relations between parenting and externalizing problems at age 15. We also anticipate that monitoring at age 15 will show a negative relation to harshness at age 11 and externalizing at age 15. Finally, we anticipate that higher levels of productive activity at home at age 11 will show a negative relation to externalizing behavior via its connection with monitoring, as it reflects higher levels of trust and communication between parent and child.

Finally, some research indicates there may be gender differences in relations between parenting and maladaptive behavior (Erath, El-Sheikh, & Cummings, 2009; Fontaine, Carbonneau, Bitaro, Barker, & Trembly, 2009). However, most studies have either used only one gender for purposes of analysis or have not tested for differences between girls and boys. In addition, findings are not consistent across samples, ages, outcomes and aspects of parenting examined (Grusec & Davidov, 2010). Consequently, we did not have sufficient support to cast clear hypotheses pertaining to gender differences as regards the interplay of multiple parenting factors and externalizing behavior from early childhood to age 15.

Methods

Participants

Data were collected as part of the NICHD Study of Early Child Care and Youth Development (www.nichd.nih.gov/research/supported/seccyd/overview.cfm). Families were contacted shortly after the birth of a healthy child in 1991 (N=1,364 families from 10 geographically separated sites). The sample for this study was determined by selecting all cases with a valid measure, the dependent variable at age 15 (N=956). Most were Caucasian (81.4%), 12% were African American and almost 22% of families had an income-to-needs ratio less than 2.0. Of the children, 49.9% were male. The 956 families in the primary analysis were compared with the 408 families for whom data were not available. Participant families were less likely to be of minority status (18.6% versus 21.8%), had a higher mean household income ($39,550 versus $33,570), and were more likely to consist of the biological mother living with her husband (79.1 % versus 71.1%). Participant parents were more likely to have attended college (72.1% versus 60.9%).

Measures

All constructs in early childhood, as well as maternal sensitivity and externalizing behaviors in middle childhood and externalizing behaviors in early adolescence, were measured by assessments at multiple age points to capture cumulative experience during particular developmental periods (Moffitt, Caspi, & Rutter, 2006). All scores were transformed to z-scores and the mean of the z-scores for a construct was used for analysis. If a case was missing one or more, but not all scores, the mean of the valid scores was used. The sample consisted of all cases that had a valid score on youth-reported externalizing behavior at age 15 and multiple imputation of missing data was performed using NORMAL 2.03 (Schafer, 1999). Table 1 displays all study measures and shows the number of cases with valid scores on each measure. In order to address problems with common reporter bias, none of the seven predictors of adolescent-report externalizing behaviors were adolescent report measures Training of data collectors from all ten data collection sites was done at a common location as was coding of the mother-child interaction videotapes. Training and certification procedures are described in NICHD Early Child Care Research Network (2001).

Opportunity for productive activity—The Home Observation for Measurement of the Environment (HOME) Inventory (Caldwell & Bradley, 1984) was used to assess opportunity for productive activity at 15 months, 36 months, 3rd grade, and 5th grade. Research assistants were trained and certified to collect HOME data and they were recertified every 6 months. Similar to the process used in earlier studies (Bradley & Corwyn, 2005, 2007), opportunity for productive activity was operationalized as a combination of access to a variety of materials for recreation and learning and engagement in activities that might afford enrichment. The latter includes involvement in family trips to facilities (e.g., libraries, museums, parks, places of business) and events (e.g., theatrical or musical performances). Eight items were used at 15 months, 11 items at 36 months, 21 items at 3rd grade, and 18 items at 5th grade (each item is scored 0 = no, 1 = yes). Average inter-observer reliability was greater than 90%.

Parental harshness—HOME Inventory (Caldwell & Bradley, 1984) items that tap expressions of anger, annoyance, physical punishment and intrusiveness were utilized to measure parental harshness. Consistent with prior studies (Bradley & Corwyn, 2007), harshness was the sum of 5 items at 15 months, 4 items at 36 months, 7 items a 3rd grade, and 5 items at 5th grade (each item is scored 0 = no, 1 = yes). For early childhood, the first two scores were standardized, then averaged. Average inter-rater reliability at each age point was > 90%.

Maternal sensitivity—Mothers' behaviors toward the study child were coded from video tapes of 15-minute semi-structured interactions in which the mother and child played in 2 or 3 age-appropriate activities. The details pertaining to coding and the composition of sensitivity (which includes high supportive presence, high positive regard, and low hostility) are described in previous studies (Vandell et al., 2010; NICHD Early Child Care Research Network, 2001). The scales at 15 months and 24 months were the sum of 3 ratings: sensitivity, positive regard and intrusiveness (reverse coded). The 36 months, 1st grade, 3rd grade and 5th grade scales were the sum of 3 ratings: supportive presence, respect for

autonomy and hostility (reverse coded). Cronbach's alphas for 15 months, 24 months, 36 months, 1st grade, 3rd grade and 5th grade were .70, .74, .78, .83, .79 and .85 respectively. Inter-observer reliability estimates for 24 months, 36 months, 1st grade, 3rd grade and 5th grade were .84, .84, .91, .79 and .83 respectively. Composites at 15, 24 and 36 months were standardized and the mean was used to measure maternal sensitivity during early childhood. The mean of scores from 1st and 3rd grades was used to measure middle childhood sensitivity; and scores from 5th grade were used to measure maternal sensitivity during early adolescence.

Monitoring—Mothers completed an 11-item questionnaire regarding parental supervision and monitoring of their 15-year-old child (Lamborn, Mounts, Steinberg, & Dornbusch, 1991). Responses to six of the questions were 1 = Don't know a lot, 2 = Know a little bit, 3 = Know a lot and 4 = Know everything. Responses to five of the questions ranged from 1 = Never to 4 = Always. The monitoring score was the mean of 11 items (α = .77).

As Table 1 shows, scores on maternal sensitivity, opportunity for productive activity, and monitoring were in the moderate to high range at all age points assessed. By contrast, scores on parental harshness were low, especially at grades 3 and 5.

Self-control—Self-control is a subscale of the Social Skills Rating Scale (SSRS; Gresham & Elliot, 1990). It is designed to reflect how the child maintains emotional and behavioral control in social situations involving parents, peers and other adults. Mothers responded to questions about the extent to which the child exhibited self-control in various conflict and non-conflict situations, including responding appropriately to teasing and criticism, controlling temper during arguments, ignoring distractions, avoiding trouble, engaging in compromise and negations, and so forth. Each item was rated on a 0 = Never to 2 = Very Often scale with scores ranging from 0 to 20 (α = .83).

Externalizing behavior—Externalizing behavior during early childhood, middle childhood and early adolescence was measured using both mother and caregiver/teacher reports. Mother reported externalizing using the Child Behavior Checklist (CBCL: Achenbach, 1992). Alternate caregivers and teachers reported externalizing behavior using the caregiver-teacher report form of the CBCL (Achenbach, 1997). Each item is rated on a 0 = Not True to 2 = Often True scale. In most cases, externalizing behavior was the sum of the aggressive scale (20 to 25 questions) and the delinquency scale (6 to 13 items), but 24-month and 36-month delinquency measures were the sum of the aggressiveness scale (15 items) and the destructiveness scale (11 items) and the 54- month measure was the sum of the attention scale (17 items) and the aggressiveness scale (23 items). All scales were transformed to z-scores before calculating the mean. For early childhood, externalizing behavior was the mean of 24-month and 36-month mother reported externalizing behaviors and 36-and 54-month teacher reported externalizing behaviors. Middle childhood externalizing was the mean of mother and teacher reports in the first and third grades, and externalizing behaviors in early adolescence was mother and teacher reports in the fifth and sixth grades. We used the combination of parent and alternate caregiver/teacher reports in order to have a more balanced and complete reflection of child behavior. At age 15, adolescents reported on their own behavior using the Youth Self-Report Externalizing

Behavior Problems subscale (YSR: Achenbach, 1992). The externalizing scale combined items from the delinquency behavior and the aggressive behavior subscales (α = .86). Andershed, Gustafson, Kerr, and Stattin (2002) recommend the use of youth self-reports for studies involving non-referred adolescents.

Analysis Plan

Path analysis was used to examine: (a) lagged relations between parenting and externalizing behaviors from early to middle childhood, (b) lagged relations between parenting and externalizing behaviors from middle childhood to early adolescence, (c) whether self-control mediates relations between productive activity, maternal sensitivity, and harshness in early adolescence and externalizing behavior at age 15, (d) whether self-control mediates relations between externalizing in middle childhood and externalizing at age 15, (e) whether maternal monitoring at age 15 mediates the relation between externalizing during early adolescence and externalizing at age 15, (f) whether self-control mediates relations between maternal sensitivity in early and middle childhood and externalizing at age 15, and (g) whether monitoring at age 15 mediates relations between productive activity in early adolescence and externalizing behavior at age 15.

Models tested—A model that included paths associated with a through e, plus the direct effects of maternal sensitivity, harshness and productive activity in early adolescence on externalizing behavior at age 15 served as a preliminary base model for the study. However, this preliminary form of the base model does not take account of the fact that there are contemporaneous relations between various aspects of parenting and contemporaneous relations between aspects of parenting and problem behavior (Rothbaum & Weisz, 1994; Williams & Steinberg, 2011). Thus, even though it was not the focus of this study to examine contemporaneous paths between the three primary parenting factors being explored or contemporaneous paths between parenting and externalizing behavior, it seemed prudent to include some such paths to assure good model fit. Likewise, a more complete base model that included some contemporaneous paths would seem more useful (i.e., accurate) when making comparisons with the two alternative models to be explored. Accordingly, this more complete base model was then compared to the two alternative models of interest. To test “f” above, paths from maternal sensitivity in early childhood and middle childhood to self-control were added to the base model (alternative model #1). A chi-square difference test, with 2 degrees of freedom, was used to determine whether the added paths resulted in a significant improvement in model fit. In order to test “g” above, a path from productive activity to parental monitoring was added to the alternative #1 model (alternative model #2). A chi-square difference test, with 1 degree of freedom, was used to determine whether the added path resulted in a significant improvement in model fit.

Preliminary analyses, including data screening, collinearity diagnostics and sample descriptions were performed using SAS version 8.0 (SAS Institute, 1999). Path analysis was conducted using AMOS version 6.0 (Arbuckle, 2005) and multiple imputation of missing data was performed using NORMAL 2.03 (Schafer, 1999).

Model fit was assessed with the omnibus chi-square, Tucker-Lewis index (TLI; Bentler & Bonett, 1980), incremental fit index (IFI; Bollen, 1989), comparative fit index (CFI; Bentler & Bonett, 1980), and root-mean square error of approximation (RMSEA; Steiger, 1990). Indirect effects equal the product of the two standardized path coefficients involved in the indirect effect and the significance of an indirect effect was assessed using the bias-corrected bootstrap resampling method available in AMOS 6.0 (MacKinnon, Lockwood, & Williams, 2004).

Results

A regression-based path analysis was conducted in which all endogenous variables were regressed on all variables that predict the endogenous variable in the model. As a further check for multicollinearity, both adolescent self-control and adolescent report externalizing behaviors were regressed on all other observed variables. There were no signs of multicollinearity. All tolerance values were greater than .50, all condition indices were less than 10 and bivariate correlations between independent variables were not excessively high (see Table 2).

Base Model

As expected, the preliminary base model did not provide a good fit, $\chi^2 = 537.553$ (67), RMSEA = .086, CFI = .896, TLI = .837, IFI = .897. Accordingly, we estimated the path between harshness and externalizing during middle childhood, given research suggesting that the relation might be particularly strong during middle childhood (Larzerele & Kuhn, 2005). Since there are modest correlations between maternal sensitivity, productive activity and harsh parenting (Bradley & Corwyn, 2007), we also decided to estimate paths between the three. Moreover, there is theoretical support (Bromwich, 1976) for the notion that affective components of parenting (e.g., enjoyment, sensitivity) establish a base for mutual satisfaction (e.g., reduced likelihood of harsh treatment), which leads to increased investment in the child (e.g., increasing opportunity for productive activity). Thus, we determined to add paths from maternal sensitivity to productive activity (assuming a positive loading) and to harshness (assuming a negative loading), and from harshness to productive activity (assuming a negative loading). However, given that six paths could be estimated between these three primary parenting constructs during middle childhood and early adolescence in an already complex model and given that there was little theoretical guidance for adjudicating between the middle childhood and early adolescence as being more salient, we used information from modification indices to add just three new paths: sensitivity in middle childhood to harshness in middle childhood, sensitivity in middle childhood to productive activity in middle childhood, and harshness in early adolescence to productive activity in early adolescence. The fit of the revised base model was good, $\chi^2 = 308.059$ (63), RMSEA = .064, CFI = .946, TLI = .910, IFI = .946. Figure 1 displays the standardized path coefficients for all direct effects in the base model.

There were moderate levels of stability for the three primary parenting constructs in the model. Opportunity for productive activity was quite stable from early childhood to early adolescence (see Figure 1). Harsh parenting was less stable, but maternal sensitivity was

also quite stable. Externalizing behavior (as reported by the combined mother and alternate caregiver or teacher) was quite stable. As expected, however, the path between the combined mother and teacher reports of externalizing problems at 5th grade and adolescent report of externalizing problems at age 15 was only moderate in strength - but note strong path to self-control.

Productive activity and externalizing problems—The path from productive activity during early childhood and externalizing problems in middle childhood was significant; but paths from productive activity in middle childhood to externalizing behavior during early adolescence and from productive activity in early adolescence and externalizing problems at age 15 were non-significant. By contrast paths from externalizing problems in early childhood to productive activity during middle childhood and from externalizing behavior in middle childhood to productive activity during early adolescence were both significant.

Maternal sensitivity and externalizing problems—Paths from sensitivity in early childhood to externalizing problems in middle childhood and from sensitivity in middle childhood to externalizing during early adolescence were significant; but the path from sensitivity during early adolescence to externalizing problems at age 15 was non-significant. Paths from externalizing problems in early childhood to sensitivity during middle childhood and from externalizing behavior in middle childhood to sensitivity during early adolescence were both significant. The path from sensitivity in middle childhood to productive activity in middle childhood was significant, as was the path from sensitivity in middle childhood to harshness in middle childhood.

Parental harshness and externalizing problems—The path from parental harshness in early childhood to externalizing problems in middle childhood was significant. However, the path linking harshness in middle childhood and externalizing in early adolescence and the path from harshness in early adolescence to externalizing at age 15 did not reach statistical significance. The path from externalizing problems in middle childhood to harshness in early adolescence was also significant.

Monitoring and externalizing problems—The path from externalizing problems in early adolescence to monitoring at age 15 was significant as was the path from monitoring to externalizing problems at age 15.

Self-control—Maternal sensitivity during early adolescence was significantly related to self-control as was the path from productive activity in early adolescence to self-control. However, the path from parental harshness was not significant

Alternative Model #1

Guided by attachment and self-determination theory (Grossman & Waters, 2005; Moller & Deci, 2010), indirect effects of maternal sensitivity in early childhood and middle childhood through adolescent self-control were added to the base model. Adding these two paths improved the fit of the model, $\chi^2 = 280.134$ (61), RMSEA = .061, CFI = .952, TLI = .917, IFI = .939. It also resulted in significant indirect effects. The χ^2 difference test, comparing

the base model to alternative #1, was significant, $\Delta\chi^2 = 27.925$ (2), $p < .01$. As Figure 2 shows, maternal sensitivity in early childhood and middle childhood were significantly related to self-control. The indirect effects for early childhood sensitivity and middle childhood sensitivity were also significant.

Alternative Model #2

Adding the path from productive activity to monitoring at age 15 improved the fit of the model compared to Alternative #1, $\chi^2 = 271.603$ (60), RMSEA = .061, CFI = .953, TLI = .918, IFI = .954. The χ^2 difference test was significant, $\Delta\chi^2 = 8.531$ (1), $p < .01$. Although the direct path from productive activity to parental monitoring (see Figure 2) was significant, the indirect effect for productive activity during early adolescence changed very little. Specifically, when the indirect effect for productive activity in early adolescence was calculated for Alternative #1 (i.e., monitoring not in the model), $\beta = -.012$. The indirect effect was changed to $\beta = -.014$ when the second indirect effect, through parental monitoring, was added to the model (see Table 3).

Even though there was insufficient support in the literature to formulate a set of clear hypotheses pertaining to gender differences in the interplay of parenting and externalizing problems from early childhood to adolescence, it seemed useful to explore the possibility of gender differences as regards the final model (Alternative #2). Specifically, following recommendations for conducting multiple group analysis stipulated by Byrne (1998), we simultaneously estimated the model for males and females. The resulting degrees of freedom and chi-square (χ^2) from this analysis is the same as adding the degrees of freedom and χ^2 from separate analyses of males and females. We then constrained all the paths between parenting factors and other parenting factors and all the paths between parenting factors and child measures to be equal for males and females (a total of 27 paths). Since the second model is nested within the first model, gender differences in the 27 paths were assessed with a χ^2 difference test. A nonsignificant difference in χ^2 would indicate that analyzing males and females together is a better fit than analyzing males and females separately. The chi-square for the multiple group analysis without constraints was 263.116 with 120 degrees of freedom. Constraining the 27 paths to be equal for males and females resulted in a non-significant change in fit, $\Delta\chi^2_{(27)} = 33.039$. Accordingly, we report results from analyses on the combined group only in Table 3.

Direct, Indirect, and Total “Effects”

Table 3 shows the direct, indirect, and total effects of primary study variables on externalizing behavior at age 15. As expected, the combined mother and teacher reports of externalizing behavior during middle childhood and early adolescence showed the strongest total effects. The combined mother and alternate caregiver report of externalizing problems in early childhood showed a somewhat smaller effect, as did self-control and parental monitoring during adolescence. Productive activity during early childhood and early adolescence had significant indirect effects but the indirect effect of productive activity during middle childhood was not significant. Maternal sensitivity showed significant indirect effects during all three developmental periods ($\beta = -.03$, $p < .01$ for all three indirect effects). Harshness during early childhood and middle childhood had significant indirect

effects through self-control, but the indirect effect of harshness during early adolescence was not significant.

Discussion

When participants were in 5th grade, we found that maternal sensitivity, parental harshness, and opportunity for productive activity were implicated in externalizing behavior (Bradley & Corwyn, 2007). These relations were partially mediated through self-control. Results from the current, more detailed set of analyses suggest developmental shifts in relations between parenting and externalizing behavior, similar to the shifts observed by Pardini et al. (2008). Relations between these parenting practices and externalizing behavior at age 15 appear to be at least partially mediated through self-control, an indication of continuity in some aspects of these relations. However, there was no evidence that parental harshness during middle childhood or early adolescence was directly related to externalizing problems as reported by the adolescent at age 15 once the other factors in the model were controlled. Rather, there was evidence that harshness during middle childhood was related to externalizing problems at age 15 indirectly via its influence on early adolescent externalizing behavior (see also Pardini et al., 2008). Finally, unlike the analysis we conducted on externalizing problems in 5th grade, those used in the current study included a consideration of parental monitoring at age 15. The results from this component of the overall model were reminiscent of those obtained from prior research: namely, higher externalizing behavior during middle childhood appears to foreshadow decreased monitoring at age 15, but higher parental monitoring at age 15 was associated with lower levels of externalizing problems at age 15 (Laird et al., 2003; Wang, Dishion, Stormshak, & Willett, 2011; Williams & Steinberg, 2011).

In our previous studies having greater opportunity to engage in productive activity was associated with less externalizing behavior (Bradley & Corwyn, 2005, 2007). Findings from this study suggest a developmental shift in these relations. Between early and middle childhood there are significant, roughly equal, paths from productive activity to later externalizing and the reverse. For children who experience low levels of productive activity in early childhood, there is an upward trend in externalizing behavior into middle childhood and adolescence. The mirror opposite is seen for children who experience high levels of productive activity. The trends abate somewhat between middle childhood and early adolescence. In our base model we observed a small significant path from productive activity at age 11 to self-control; but this path became non-significant in the final model that included a path from productive activity to monitoring. This apparent weakening of the relation is not surprising when viewed from the perspective of self-determination theory and principles connected to effectance motivation (Moller & Deci, 2010). Specifically, as children increase the time spent away from home, a greater proportion of their opportunities for intrinsically motivated activities occur in other venues. Likewise, activities connected to home (as contrasted to activities outside the home) may not provide the kinds of challenges needed for continued development of a sense of agency and self-control (Little, Snyder, & Wehmeyer, 2006; Soenens & Vansteenkiste, 2010). Unfortunately, we did not have a measure to assess the extent to which children were engaged in productive activities outside the home. Thus, we do not know whether the non-significant findings pertaining to home-

based productive activity reflects increasing importance of what occurs outside the home and shifting social ties or something else (Dishion & Patterson, 2006; Eccles et al., 1993; Gutman & Eccles, 2007).

Our findings suggest that the most significant effects of harsh parenting on externalizing behavior may occur during early and middle childhood, as did Pardini et al. (2008) and Hipwell et al. (2008). The only significant lagged path observed between harsh parenting and externalizing was the one between harsh parenting in early childhood and externalizing during middle childhood. That is not to say that harshness during a given developmental period is unassociated with externalizing problems. Indeed, we found an association at all developmental periods and there was a significant path from harshness to externalizing problems in middle childhood. Rather, externalizing becomes quite stable beginning in middle childhood and the level of harshness thereafter does not seem to change a child's level of externalizing behavior. By contrast, the level of externalizing behavior during middle childhood appears to continue to exert an upward press on parental harshness, as well as a downward press on providing opportunities for productive activity and monitoring. Our findings do not contradict research showing a relation between parents' use of harsh treatment and children's antisocial behavior (Dishion & Patterson, 2006; Gershoff et al., 2012; Jaffee et al., 2006), but speak to evolving patterns of parent and child behavior through time. Our findings suggest that harshness in early and middle childhood help establish a pattern of externalizing behavior that persists to age 15. The parenting system continues to evolve in response to children's behavior. Overall the findings would appear to correspond to conclusions offered by Lansford et al. (2009): namely, externalizing behavior is more often associated with levels of physical punishment at a given point in time than changes in the use of physical discipline across time. In this regard, it is important to mention that our measure of harshness did not fully capture serious maltreatment and our sample did not include many high-risk families.

Maternal sensitivity at each period of development appears to promote adaptive functioning. Finding that self-control functions as a mediator of relations between maternal sensitivity at each period of development and externalizing behavior at age 15 is consistent with attachment theory (Grossman & Waters, 2005), self-determination theory (Moller & Deci, 2010) and a variety of other theories that address how social factors are implicated in the development of self-regulatory competence (Dishion & Patterson, 2006; Simons et al., 2006). Although sensitive mothering appears to reduce the likelihood adolescents will engage in externalizing behaviors as a consequence of improving their self-control, relations between maternal sensitivity and externalizing behavior appear complex and bidirectional. Consistent with Moffitt's (1993) arguments, when children are non-compliant and present challenging behaviors, there is a tendency for caregivers to become less sensitive: a process that begins early in life (see also Williford et al.,, 2007). If anything, the “degrading effect” of high externalizing behavior on maternal sensitivity appears to become stronger from middle childhood to adolescence, a time when interpersonal relationships are often being renegotiated. It is interesting that lower sensitivity during middle childhood was associated with greater harshness during middle childhood, which in turn was associated with more externalizing problems and lower self-control.

Dishion and colleagues (2004) make the point that when parents are consistently confronted by negative and antisocial behavior on the part of their children, they have a tendency not only to become less sensitive but also to disengage from the child. The reduction in maternal sensitivity from middle childhood to early adolescence for children high in externalizing, together with the negative path between externalizing behavior in early adolescence and parental monitoring at age 15 would seem to support such a premise, as would findings by Pardini et al. (2008). It would appear to be further buttressed by the current finding of a negative path from externalizing behavior in middle childhood to opportunity for productive activity measured in early adolescence and a negative path from harshness to productive activity in early adolescence.

Granting the developmental shifts in patterns of relations between parenting and externalizing we observed in this follow-up study, there was also considerable consistency with findings we observed when we examined externalizing problems at 1st and 5th grades (Bradley & Corwyn, 2005, 2007). The consistency of findings from early childhood to adolescence is not surprising even though parent-child relationships are often re-negotiated during adolescence (Ashbourne, 2009). The similarity of findings across the three age points now examined (1st grade, 5th grade, and age 15) to some extent reflect the stability of the home factors measured, the outcome (externalizing behavior) and the mediator (self-control). Others have reported moderate levels of stability in parental behavior, self-regulatory competence and anti-social behavior as well (Dishion & Patterson, 2006; Williams & Steinberg, 2011). This moderate consistency resembles what has been reported for a variety of different personality characteristics and may reflect niche building that grows as children age (de Haan, Prinzie, & Dekovic, 2010). A particularly revealing finding is that the paths between productive activity, sensitivity and harshness during early childhood and age 11 were significant in a model that also included significant paths between the early childhood parenting behaviors and middle childhood parenting behaviors and between middle childhood parenting behaviors and parenting behaviors at age 11. This suggests that, even though patterns of parenting behavior are not fixed (as will be discussed in greater detail later), there is a tendency for parenting behaviors to revert to patterns linked to relatively stable personality and contextual conditions.

Although our primary focus was on three aspects of home experience we have examined in earlier studies, including parental monitoring at age 15 provided a more comprehensive perspective on how parenting is implicated in externalizing behavior. As has been noted in previous studies, when youth continually manifest externalizing problems, parents tend to quit monitoring them as closely (Dishion et al., 2004; Laird et al., 2003; Williams & Steinberg, 2011). The negative path we observed between externalizing behavior during early adolescence and parental monitoring at age 15 corroborates this relation. However, when parents do engage in high levels of monitoring, their children tend to manifest less risky behavior and fewer externalizing problems (Lac & Crano, 2009; Lahey, Van Hulle, D'Onofrio, Rodgers, & Waldman, 2008; Wang et al., 2011). The fact that these latter two measures were both given at age 15 in our study gives us no basis for attributing causal direction; but our finding is consistent with findings from other studies (Pardini et al., 2008). One of the most interesting findings that emerged pertaining to monitoring in this study was the significant path from productive activity at age 11 to monitoring at age 15. It suggests, as

we stated earlier, that constructive monitoring is part of a larger package of effective engagement and communication between parent and child, one that continues to support the child's maturity and self-direction (Anderson & Branstetter, 2012; Joussemet et al., 2008).

In this follow-up, we examined relations between four aspects of parenting and child externalizing problems. Results showed significant associations between each aspect examined while simultaneously controlling for the others. This approach is in keeping with research showing that externalizing problems reflects a multiplicity of influences, ecological theory (i.e., the impact of one contextual factor is often conditioned by other contextual factors), and both cultural and personality theory (i.e., certain patterns of parenting practices in any culture or for any individual tend to co-occur). Studying only a single parenting practice at a time (without controlling for others) runs the risk of spurious or misleading findings (Williams & Steinberg, 2011). Although the structure of our data and the lack of genetic controls limit what can be concluded from the findings, the observed inter-connection between parental harshness and maternal sensitivity (the two measured using separate assessment techniques) in this study would seem instructive. The broader literature on the use of harsh physical punishment and parental warmth suggests a kind of functional relation as regards children's adaptive behavior (Pardini et al., 2008; Simons et al., 2007; Williams & Steinberg, 2011). What would seem particularly worthy of future study are combinations that involve high levels of two or more parenting practices considered damaging and combinations of conditions that reflect too much bad coupled with too little good. In that vein, it would seem worthwhile for future research to examine such combinations for girls and boys separately as well as in combination. Even though our overall model did not suggest broad gender differences in patterns of relations, some coefficients approached significance (e.g., the path between parental harshness and opportunity for productive activity in early adolescence). Such indications, along with others in the literature, would argue for continued examination within gender.

Although our findings suggest that both parent and child behavior is open to influence, it is important to bear in mind that the strength of associations between variables observed in our study were quite modest. The observed modest effects may partially reflect the fact that we observed few instances of harshness at the level of maltreatment and the fact we had a limited measure of harshness. It is also important to bear in mind that there was about 30% attrition over the 15 years of the study and that we had a relatively small proportion of minority and high-risk families. We also had missing data on measures, particularly teacher reports of externalizing behavior during early childhood. We tried to compensate for the missing data by using composites from multiple reporters and multiple time periods when we could and also worked to carefully impute data using accepted methods. Finally, in interpreting the findings it is important to bear in mind potential technical constraints in the models we tested. Specifically, not all the key variables were equally stable. Most notable is the modest stability in parental harshness. Thus, part of the observed “lessening” of impact from parental harshness on externalizing after middle childhood could reflect differential stability in the two constructs.

Much remains undetermined about how parenting is implicated in the development of externalizing problems and vice versa. Even so, our findings and findings from previous

studies suggest that programs aimed at parents may need to take somewhat different tacks depending upon the age of the child. During the preschool period, it would seem useful to assist parents in developing child management techniques that limit the use of harsher forms of control and that emphasize consistency in the use of management strategies. Our findings pertaining to productive activity in early childhood suggest that proactive and not just reactive strategies need to be part of the overall management strategy. Later, as the wear and tear of dealing with disruptive and non-compliant behavior builds, there may need to increased focus on the parents themselves, with particular attention on ways to address the parent's own emotional needs and sense of agency. As children transition into adolescence, helping parents find useful ways to engage in monitoring and to continue efforts to productively and positively engage with children who manifest behavioral difficulties would seem advisable. The latter may include finding new ways of spending time together and also encouraging the child's involvement in positive youth activities outside the home (Lerner et al., 2005). During this period when children are pressing for autonomy and the parent-child relationship is being re-negotiated, it may be useful to offer guidance to parents as to how to reformulate their ideas on the roles of parents and their understanding of how their behavior is being interpreted by their offspring.

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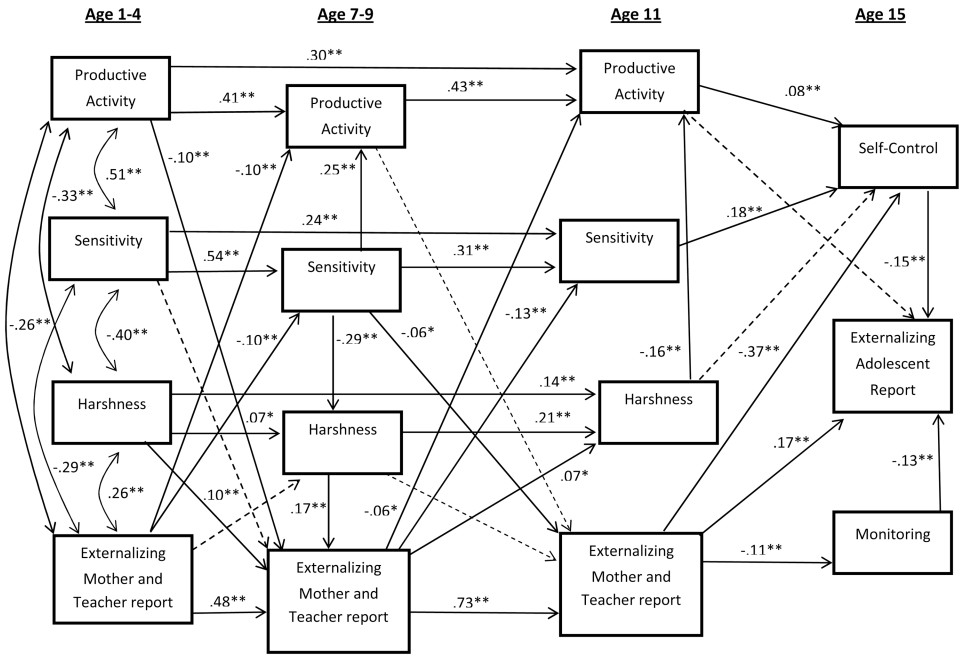

Figure 1.

Path analysis depicting lagged, contemporaneous and indirect effects between parenting and externalizing behavior. This base model displays adolescent self-control as a mediator between parenting and externalizing at age 15 and a mediator between combined mother and teacher-reported externalizing in early adolescence and externalizing at age 15. Parental monitoring is depicted as a mediator between combined mother and teacher-reported externalizing in early adolescence and adolescent-reported externalizing at age 15. Standardized parameter estimates. ** $p < .01$. * $p < .05$.

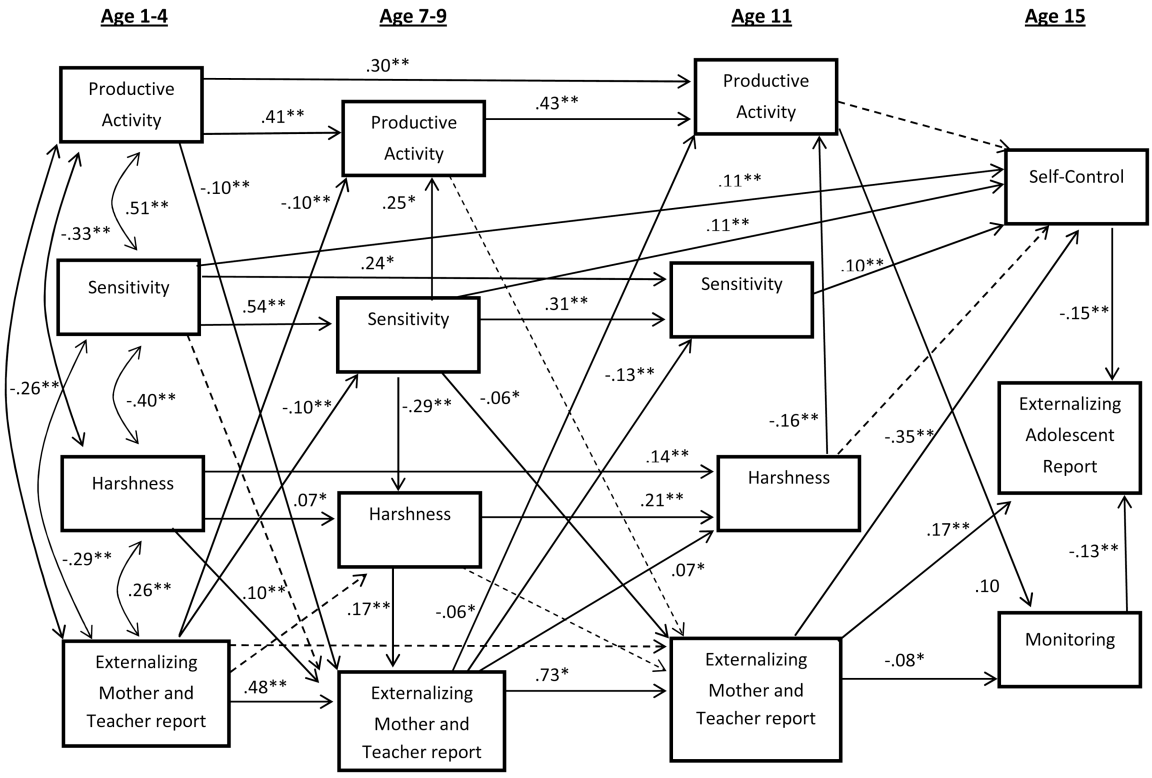

Figure 2.

Path analysis depicting lagged, contemporaneous and indirect effects between parenting and externalizing behavior. The figure is the same as shown in Figure 1 with the addition of paths that tests alternative model #1 and alternative model #2. Alternative model #1 adds paths from maternal sensitivity in early childhood and middle childhood to adolescent self-control at age 15. Alternative model #2 adds a path from productive activity in early adolescence to maternal monitoring at age 15. Standardized parameter estimates. ** $p < .01$. * $p < .05$.

Table 1

Description of measures

	Assessment period	# items	Mean (SD)	N
Productive Activity – EC	15 months	8	6.96 (1.38)	924
	36 months	11	7.19 (2.50)	903
Productive Activity – MC	3rd grade	21	14.85 (3.34)	893
Productive Activity – EA	5th grade	18	14.32 (3.05)	919
Sensitivity – EC	15 months	3	9.45 (1.63)	930
	24 months	3	9.42 (1.74)	902
	36 months	3	17.32 (2.67)	901
Sensitivity – MC	1st grade	3	16.92 (3.03)	864
	3rd grade	3	16.40 (2.45)	875
Sensitivity – EA	5th grade	3	16.55 (2.43)	851
Harshness – EC	15 months	5	1.62 (.83)	919
	36 months	6	1.83 (1.14)	894
Harshness – MC	3rd grade	7	.77 (1.01)	894
Harshness – EA	5th grade	5	.31 (.67)	919
Monitoring	age 15	11	3.55 (.31)	935
Self-control	age 15	10	14.04 (3.46)	937
Externalizing – EC	24 months (mother)	26	52.33 (8.34	914
	36 months (mother)	26	51.03 (8.33)	910
	36 months (teacher)	26	46.10 (9.73)	630
	54 months (teacher)	40	49.80 (9.53)	768
Externalizing – MC	1st grade (mother)	33	48.54 (9.67)	883
	3rd grade (mother)	33	47.17 (9.72)	917
	1st grade (teacher)	34	50.57 (8.66)	860
	3rd grade (teacher)	34	51.34 (9.21)	857
Externalizing – EA	5th grade (mother)	33	45.72 (9.94)	923
	6th grade (mother)	33	45.88 (10.05)	937
	5th grade (teacher)	34	50.78 (9.12)	834
	6th grade (teacher)	34	49.99 (9.10)	787
Externalizing– age 15	age 15 (youth report)	30	49.31 (9.91)	956

Measures with multiple indicators were transformed to z-scores and the mean of the *z*-scores were used in analyses. EC = early childhood; MC = middle childhood; EA = Early Adolescence

Table 2

Correlations between study variables

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.	Prod. Activity—EC	1.00														
2.	Prod. Activity—MC	.53	1.00													
3.	Prod. Activity—EA	.56	.62	1.00												
4.	Sensitivity—EC	.51	.50	.48	1.00											
5.	Sensitivity—MC	.44	.45	.43	.56	1.00										
6.	Sensitivity – EA	.38	.33	.34	.45	.49	1.00									
7.	Harshness—EC	-.33	-.30	-.34	-.40	-.31	-.26	1.00								
8.	Harshness—MC	-.16	-.26	-.16	-.19	-.31	-.18	.16	1.00							
9.	Harshness – EA	-.12	-.17	-.26	-.15	-.21	-.17	.20	.23	1.00						
10.	Monitoring—age 15	.14	.08	.12	.09	.06	.11	-.03	-.03	-.02	1.00					
11.	Self-control—age 15	.27	.30	.25	.32	.34	.34	-.21	-.18	-.15	.17	1.00				
12.	Externalizing – EC	-.26	-.26	-.25	-.29	-.26	-.24	.26	.13	.14	-.13	-.29	1.00			
13.	Externalizing—MC	-.31	-.31	-.31	-.31	-.34	-.30	.30	.25	.17	-.10	-.41	.56	1.00		
14.	Externalizing—EA	-.06	-.13	-.09	-.12	-.12	-.12	.09	.10	.10	-.17	-.25	.13	.24	1.00	
15.	Externalizing—age 15 -.34	-.28	-.31	-.30	-.32	-.33	.26	.20	.20	-.10	-.45	.46	.77	.26	1.00	
	Sample Size	939	893	949	941	932	918	939	918	919	933	935	937	893	954	956

EC = early childhood; MC = middle childhood; EA = Early Adolescence

Table 3
Direct, indirect and total effects predicting externalizing behaviors at age 15

	Direct effects	Indirect effects	Total effects
Prod. Activity - EC		-.026 (-.039, -.015)**	-.026 (-.039, -.015)**
Prod. Activity - MC		-.001 (-.020, .000) *ns*	-.001 (-.020, .000) *ns*
Prod. Activity – EA		-.012 (-.022, .-005)*	-.012 (-.022, .-005)*
Sensitivity - EC		-.033 (-.048, -.023)**	-.033 (-.048, -.023)**
Sensitivity - MC		-.034 (-.047, -.024)**	-.034 (-.047, -.024)**
Sensitivity – EA		-.027 (-.040,-.016)**	-.027 (-.040,-.016)**
Harshness – EC		.020 (.011, .032)**	.020 (.011, .032)**
Harshness - MC		.030 (.018, .045)**	.030 (.018, .045)**
Harshness – EA		.005 (-.003, .014) *ns*	.005 (-.003, .014) *ns*
Externalizing – EC		.101 (.079, .126)**	.101 (.079, .126)**
Externalizing - MC		.181 (.144, .215)**	.181 (.144, .215)**
Externalizing – EA	.173 (.117, .226)**	.070 (.045, .099)**	.244 (.195, .292)**
Self-control – age 15	-.151 (-.210, -.092)**		-.151 (-.210, -.092)**
Monitoring – age 15	-.128 (-.184, -.073)**		-.128 (-.184, -.073)**

* $p < .05$,

** $p < .01$; 95% confidence intervals in parentheses; coefficients are standardized;

ns = nonsignificant

EC = early childhood; MC = middle childhood; EA = Early Adolescence