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Over-time associations among parental self-efficacy, promotive parenting practices, and
adolescents' externalizing behaviors

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Abstract

Parents' self-efficacy (PSE) describes parents' beliefs about their abilities to influence their children in a way that foster the child's positive development. Research has shown links among PSE, parenting, and children's behavior (Jones & Prinz, 2005), but there are still questions concerning the associations over time. Theory predicts three types of processes relevant to these associations: a PSE-driven process, a parent behavior-driven process, and a child-driven process. In this study, we tested these processes during early to middle adolescence using reports from 401 mothers and fathers from 305 families, and their adolescents ($M_{age} = 11.5$), at three time points. Cross-lagged panel models were used to examine the associations among PSE, promotive parenting practices, and adolescents' externalizing. Results supported a PSE-driven process for mothers within early adolescence. Additionally, evidence for parent behavior-driven and child-driven processes emerged at different times within this developmental period.

Keywords: Parental self-efficacy, adolescents, parenting

Over-time associations among parental self-efficacy, promotive parenting practices, and adolescents' externalizing behaviors

Introduction

Parental self-efficacy (PSE) has been argued to play an important role in parenting and children's behaviors. PSE describes parents' beliefs about their abilities to influence their children in a way that fosters the child's positive development and adjustment (Ardelt & Eccles, 2001; Bandura, 1977). Several studies have shown associations among PSE, parenting practices, and children's behavior (for reviews, see Coleman & Karraker, 1997; Jones & Prinz, 2005). This research, however, is characterized by reliance on one-time correlational designs, and, thus, little is truly known about how these processes unfold over time. In fact, assumptions about causality have been made on several occasions without the use of longitudinal data. In most of these studies, a PSE-driven process, where PSE predicts children's behaviors either directly or through parenting practices, has been assumed in the conceptual and analytical models. Fewer studies have examined potential bi-directional processes with respect to PSE. This study thus addresses a critical need in that we examine all possible processes involving PSE, parenting practices, and adolescents' behaviors longitudinally. We focus on early to middle adolescence because it is a time when parental efficacy seems to be at a low point (Ballenski & Cook, 1982).

Theory Regarding the Associations among PSE, Parenting Practices, and Children's Behavior

Conceptually, PSE has been linked to both promotive parenting practices and positive child behavior (Ardelt & Eccles, 2001; Bandura, 1997; Jones & Prinz, 2005). Promotive parenting practices describe parents' positive practices that aim to cultivate children's skills, talents, and interests as well as preventing negative adjustment (Furstenberg, Cook, Eccles, Elder, &

Sameroff, 1999). The associations among PSE, promotive parenting practices, and child behaviors might be described as a feedback loop (Bandura, 1986, 1997), involving reciprocal processes. Bandura (1986, 1997) proposes the idea of a feedback loop, in which higher self-efficacy leads a person (e.g., parent) to engage in positive behavior, which produces positive outcomes in the target of those actions (e.g., child), which then lead to higher efficacy in the actor (e.g., parent). *Parenting* self-efficacy (PSE) is thus expected to increase promotive parenting, which should, in turn, be linked to more positive child behaviors. If, in turn, parents evaluate more positive child behavior as an indicator of mastery or success, PSE should increase as a result (PSE→promotive parenting practices→child behaviors→PSE). Three separate processes can be identified in the feedback loop.

In the first process—a *PSE-driven process*—PSE is an antecedent to children’s adjustment, influencing it directly or indirectly through promotive parenting practices. If parents believe that they are capable of influencing their children in a positive way, they are more likely to use promotive parenting practices, which in turn should be linked to positive adjustment in their children (PSE→promotive parenting practices→child behaviors; Ardelt & Eccles, 2001; Bandura, 1997). Additionally, it has been suggested that PSE affects children’s behavior directly through role modeling, where children adopt their parents’ attitudes and beliefs, independent of parenting practices, and this in turn is linked to positive child adjustment (Ardelt & Eccles, 2001; Dumka, Gonzales, Wheeler, & Millsap, 2010; Jones & Prinz, 2005). This idea is somewhat problematic, however, as it links one person’s cognitions with another persons’ behavior directly, without a mediating process.

A second process identified in the feedback loop is a *parent behavior-driven process*. In this process, promotive parenting practices predict PSE because PSE is a reflection of parenting

effectiveness. According to Bandura (1977), the most effective way of increasing a persons' sense of self-efficacy is through mastery experiences. In situations of success, the sense of self-efficacy strengthens, and in situations of failure, the sense of self-efficacy weakens. Promotive practices should thus boost PSE because such practices are likely to have a positive effect on the child's behavior (promotive parenting practices → child behaviors → PSE).

The third process in the feedback loop is *child-driven*. In this process, children's behavior influences parents' efficacy (child behaviors → PSE). Positive child behaviors should make parents believe more positively about the parent-child relationship, including their own ability to influence their children's behavior. A child-driven process is consistent both with longstanding ideas of child-effects on parenting (Bell, 1968; Maccoby & Martin, 1983), and with more recent theorizing about bi-directionality in the parent-child relationship (e.g., Kuczynski, 2003; Lollis & Kuczynski, 1997).

In the current study, we test all of these component processes of the proposed feedback loop as children develop from early to middle adolescence. Testing all component processes is important because, as will be shown, existing research on PSE has focused on the PSE-driven process to the exclusion of the other processes.

Empirical Findings Regarding the Associations among PSE, Parenting Practices, and Children's Behavior

Several studies have shown links between high PSE on the one hand and promotive parenting practices such as parental involvement and support on the other. In addition, high PSE has been linked to children and adolescents' positive behavior directly, and indirectly via parenting practices (for reviews, see Coleman & Karraker, 1997; Jones & Prinz, 2005). In the majority of these studies, the results have been assumed to support a PSE-driven model, but

because these results are based on one-time correlational designs, they do not illuminate the processes over time. Results from a few longitudinal studies have supported a PSE-driven process specifically by showing that PSE at one time predicted parenting practices and child behaviors at a later time (e.g., de Haan, Prinzie, & Decović, 2009; Verhage, Oosterman, & Schuengel, 2013). One shortcoming of these longitudinal studies is that they did not include all three constructs (PSE, parenting practices, and children's behaviors) at all time points, and therefore do not offer a complete picture concerning all of the above-mentioned processes. These studies also focused on parents of pre-adolescent children, so they do not speak to PSE-related processes among parents of adolescents.

Only three studies, to our knowledge, have included longitudinal data on PSE, parenting, and child or adolescent behaviors with at least three waves of data. The use of three data points makes it possible to examine all plausible over-time processes. Although some of these studies did not examine parents of adolescents, the results are reviewed here because they offer insight concerning associations over time that might give insight into processes among parents of adolescents.

The first of these longitudinal studies (Dumka et al., 2010) involved Mexican American mothers and their children followed through adolescence (11 to 14 years old at T1). In this study, the authors examined the causal link between PSE and positive maternal control practices. Additionally, they tested whether these were linked to changes in adolescents' conduct problems. The results showed that PSE predicted changes in both parenting and adolescents' behaviors. Parenting, however, did not predict changes in PSE or adolescents' behaviors. Hence, the results were consistent with a PSE-driven process and inconsistent with a parent behavior-driven process. The authors in this study did not test a child-driven process.

Two other three-wave longitudinal studies have shown support for a child-driven process. In the first of these studies (Teti & Gelfand, 1991), mothers' perceptions of their infants' temperament predicted PSE (which in turn predicted mothers' parenting practices). This was the only process that was tested. The second study (Slagt, Deković, de Haan, van den Akker, & Prinzie, 2012) included mothers and fathers and their children followed from pre-adolescence to adolescence (6 to 10 years old at T1). The authors tested a PSE-driven process where PSE predicted changes in children's externalizing directly (PSE→child behaviors) or via supportive parenting and inept discipline (PSE→parenting→child behaviors). They also tested two child-driven processes: one in which child behaviors predict PSE directly (child behaviors→PSE), and one indirect, in which children's externalizing predicted changes in PSE via supportive parenting and inept discipline (child behaviors→parenting→PSE). The results showed partial support for a PSE-driven process, in that PSE predicted parenting practices, but PSE did not predict changes in children's behaviors. Additionally, the results supported a child-driven process in that children's externalizing predicted changes in PSE directly (for both parents) and indirectly through the use of inept discipline practices (for mothers only). Thus, results from these two studies support reciprocal processes with respect to parenting and PSE, and a child-driven process with respect to children's behaviors and PSE.

Although the results of the studies above offer insight into the over-time associations among PSE, parenting, and children's behaviors, this insight is limited. First, none of these studies have measured all constructs at all three time points, so it is unknown how the results would have been influenced if the authors had controlled for stability in the constructs. Second, all the theoretical processes have not been tested. Thus, there remains a need for a full test of the associations among PSE, promotive parenting practices, and children's behaviors over time.

Third, most of these studies are based on parents of pre-adolescent children. Given that adolescence appears to be a low-point in PSE (Ballenski & Cook, 1982), but that research shows continuing parental influence at adolescence (e.g., Galambos, Barker, & Almeida, 2003; Vandell, 2000), it is important to study these processes during adolescence. Processes among parents of pre-adolescents might be different from processes among parents of adolescents, given different parental experiences, developmental abilities and needs, and family history in these different developmental periods. For example, it is possible that child-driven processes become more common than PSE-driven processes during adolescence due to increasing child independence and choice. Similarly, externalizing might be linked to reduced PSE more so for parents of adolescents than for parents of pre-adolescents, as such behaviors might be associated with stereotypes of adolescents as being less influenced by parents and more influenced by friends (Buchanan & Holmbeck, 1998; Buchanan & Hughes, 2009).

Differences between Mothers and Fathers in the Associations among PSE, Parenting Practices, and Adolescents' Behaviors

Although children have very different relationships with their parents (Steinberg & Silk, 2002), few studies have examined the associations among PSE, parenting practices, and children's behaviors, separately for mothers and fathers (Jones & Prinz, 2005). When comparisons have been made, the results have shown that children's problematic behaviors are linked more strongly to mothers' PSE than to fathers' PSE (Meunier & Roskam, 2009; Murdock, 2012; Slagt et al., 2012). One explanation offered for this difference concerns the level of involvement in child rearing activities. Despite increasing paternal involvement in direct caregiving of children (Murdock, 2012), mothers still report spending more time with their adolescents than fathers do (Phares, Fields, & Kamboukos, 2009). With more involvement there

is an increased likelihood of experiencing different child behaviors and to be able to evaluate the effectiveness of one's parenting practices from these behaviors. Another explanation for these differences might be that mothers are better attuned to non-verbal cues in their children than are fathers, given sex differences in emotional experiences and expressions (e.g., Brody & Hall, 2000). Hence, in comparison to fathers, mothers' PSE might be more strongly influenced by child's behavior (i.e., child-driven processes might be more likely among mothers than among fathers). For the other processes we do not expect differences between mothers and fathers.

The Present Study

In this study, we fill a critical gap in existing literature by examining the over-time associations among PSE, promotive parenting practices, and adolescents' externalizing from early to middle adolescence. Externalizing behavior was chosen as the adolescent behavior of interest for two primary reasons. First, externalizing, or deviance, is an important and much-studied aspect of adolescent adjustment. Second, we expected that promotive parenting (as an example of parenting in the "guided learning domain") should be linked to adolescents' externalizing because of its relation to social, emotional, and behavioral regulation skills (Grusec & Davidov, 2010).

To test all processes predicted by Bandura's feedback loop, we used a three-wave longitudinal sample of mothers and fathers and their adolescents, and performed cross-lagged panel analyses with parents' sex as a moderator for all paths in the models. First, concerning a PSE-driven process we expected PSE to predict changes in adolescents' behavior via promotive parenting practices, but we did not expect PSE to be directly linked to adolescents' externalizing. Second, because mastery experience is the most effective way of increasing self-efficacy (Bandura, 1977), we expected to find evidence of a parent behavior-driven process, even though

this process has not yet been empirically tested. Third, given theory and research supporting child-driven processes, we expected adolescents' externalizing to predict changes in PSE over time. In fact, we thought that a child-driven process might become more prominent over the developmental period we studied given the increasing independence of adolescents over this time, and given that beliefs about declining parental influence at adolescence might change parent and adolescent behavior in a way that actually reduces parental influence (Buchanan & Hughes, 2009). In line with earlier research, we expected adolescents' externalizing to more strongly predict mothers' PSE than fathers' PSE.

Method

Participants and Procedure

The data for this study were derived from a three-wave longitudinal study of 305 families. In some of the families (48%), both parents participated, whereas in other families only the mother (47%) or only the father (5%) participated. One adolescent from each family participated. The first time point (T1) of the data collection took place in 1999-2000, the second time point (T2) took place one year later, and the third time point (T3) took place an additional two years later. Families were recruited from two public middle schools in the southeastern United States. An information letter was sent home to parents of 6th and 7th graders and additional presentations were made at school related functions in which parents were present. In the first school, 40% of the parents who were asked to participate did so. In the second school, 34 additional families agreed to participate. It is unknown what proportion of parents in the second school this represented, as the teacher who distributed the materials did not keep track of the total number of families who were contacted. At T1 and T2, parents and adolescents were interviewed via phone (approximately one hour in length), and they also filled out written

surveys. At T3, only written surveys were obtained. For this study, we used data from the interviews at T1 and T2, and from the written surveys at T3. For each wave, mothers and fathers were paid US\$50 and adolescents were paid US\$25 for their participation.

In total, participants included 286 mothers and 115 fathers ($N = 401$) and 305 adolescents. Of the adolescents, 191 were boys and 210 were girls, and they were in either 6th grade ($M_{\text{age}} = 11.15$, $SD = 0.39$, $n = 201$) or 7th grade ($M_{\text{age}} = 12.20$, $SD = 0.44$, $n = 200$) at T1. At the first time point, the mean age of the mothers was 39.12 years ($SD = 5.47$) and for fathers it was 41.37 years ($SD = 5.94$). Concerning parental education, 3% had less than a high school education, 20% had a high school education only, 48% had some college or vocational education, 23% had a college degree only, and 6% had a graduate or professional degree. The majority (61%) of the parents were married at T1. Most parents were European American (67%) or African American (32%); 1% were Latino. Family income was measured categorically and distributed as follows: Over US\$150,000 (2%); US\$75,000–US\$150,000 (18%); US\$40,000–US\$75,000 (38%); US\$20,000–US\$40,000 (32%); and below US\$20,000 (11%). At T1, the median income corresponded to the median income for the county and nation. The sample included somewhat fewer European American and Hispanic persons and somewhat more African American persons compared with the numbers for the state (72%, 5%, and 22%, respectively) and the nation (75%, 12%, and 12%, respectively), but reflected the overall ethnic composition of the schools from which participants were drawn.

All participants provided complete data at T1, and 90% of these had complete or partially complete data on parent-reported and adolescent-reported variables at T2, T3, or both T2 and T3. We compared parents who had complete data at all time points (56%) to parents who had any missing data at T2 and/or T3, on their ethnicity, child sex, family income, parents' education

(less than high school, high school, college, or graduate or professional school), family structure (parents living together versus not), and all study variables at T1. The results showed only one significant difference: parents who had full data were more likely to be married than parents with any missing data.

Measures

Parents reported on questions concerning PSE and promotive parenting practices, and adolescents reported on their own externalizing. Items from each scale (described below) were used as indicators for latent variables. Three indicators were used for all latent variables, as it creates a just-identified model (Little, 2013) and simplifies the measurement model.

Parental self-efficacy. We used two task-specific PSE scales that were available at the time this project was conducted. For these scales, we combined items into three indicators using a univariate parceling approach, in which items that theoretically measure the same construct—and therefore should share variance—are combined (Little, Rhemtulla, Gibson, & Schoemann, 2013). Using parcels as indicators rather than single items, reduces the number of parameters being estimated, which often improves model convergence (e.g., Coffman & MacCallum, 2005) and might be one way to increase power of latent variable models. As has been proposed as a first step in creating parcels (Little et al., 2013), we performed Exploratory Factor Analyses (EFA) on the T1 items with a fixed number of factors (3). Additionally, because all items with a parcel should be strongly correlated, we reviewed the correlation matrix of the items. The final parceling solutions were based on the results from the EFAs, correlations, and theory. The same parcels were used at all time points.

The first PSE measure was adapted from Ballenski and Cook (1982), who presented it as a measure of parents' perceived competence in managing specific parenting tasks at different

developmental ages. For this study, we used the items for perceived competence in parenting of adolescents. Parents rated how comfortable they felt in: “Dealing with discipline for the child”, “Maintaining adequate limits for the child”, “Adjusting to the child’s demands for independence”, “Dealing with the child’s demands for privacy”, “Dealing with moodiness in the child”, “Dealing with rebellious or defiant behavior in the child”, and “Dealing with conflicts with the child”. The last two items were added for this project so as to capture tasks specific to domains of “storm and stress” among adolescents (e.g., Arnett, 1999; Buchanan & Hughes, 2009). Parents responded on a Likert scale ranging from 1 (*Always comfortable*) to 6 (*Never comfortable*). The items were reversed so that high values represented high perceived competence in managing the tasks. The results from the EFA showed three separate factors: all but one item loaded strongly on only one of these. The exception was the first item, which loaded strongly on two factors (representing the first and second parcels). In line with theory, this item was parceled with the second item to form an indicator concerning PSE about maintaining parental authority ($r = .52$ at T1, $r = .48$ at T2, and $r = .56$ at T3 between the two items). The items in the second and third parcels were identical with the results gained from the EFA. The second parcel included the third and fourth items, and captured an indicator of PSE about dealing with adolescents’ demands for autonomy ($r = .45$ at T1, $r = .40$ at T2, and $r = .54$ at T3). The three last items were parceled to form the third, and final, indicator dealing with PSE in handling adolescents’ stereotypical “storm and stress” behaviors (e.g., Arnett, 1999; Buchanan & Hughes, 2009; $rs = .52-.76$ at T1, $rs = .47-.79$ at T2, and $rs = .43-.71$ at T3).

The second measure of PSE was taken from Freedman-Doan, Arbretton, Harold, and Eccles (1993). Parents rated how much they thought they could influence their children in the following ways: “To help the child get good grades in school”, “To increase the child’s interest in school”,

“To prevent the child from getting in with the wrong crowd”, “To prevent the child from doing things they do not want him or her to do outside the home”, and “To get the child to stay out of trouble in school”. Response options ranged from 1 (*Very little*) to 7 (*A great deal*). In the EFA, three separate factors emerged with each of the items loading strongly on only one of them. In line with the results from this analysis, the first two items were parceled to capture an indicator of PSE about facilitating the child’s school adjustment ($r = .59$ at T1, $r = .60$ at T2, and $r = .56$ at T3), and the third and fourth items were parceled to form an indicator of PSE concerning preventing negative behaviors in unsupervised contexts (the third and fourth items, $r = .62$ at T1, $r = .65$ at T2, and $r = .52$ at T3). The last item loaded strongly on a third, separate, factor, and was, therefore, kept as a single-item indicator capturing PSE for preventing the child to stay out of trouble in school.

Promotive parenting practices. In one of the first conceptualizations of PSE, Ardel and Eccles (2001) introduced promotive parenting practices as an outcome of PSE, and it was operationalized as parental involvement, encouragement, and proactive prevention—behaviors that are often thought of as being part of the responsiveness dimension of parenting (Maccoby & Martin, 1983). Therefore, in this study, we used parents’ reports on three scales to measure promotive parenting practices: *Parental involvement*, *positive parenting practices*, and *discussion during punishment*. These three scales were similar to the scales used in the article by Ardel and Eccles (2001), and we, therefore, expected them to be good indicators of an overall latent variable of promotive parenting. The *parental involvement* scale (Frick, Christian, & Wootton, 1999) included 10 items and measured parents’ general involvement in their adolescents’ life. Parents responded how often various types of involvement occurred; examples are: “You have a friendly talk with your child”, “You play games or do other fun things with

your child”, “You ask your child about his or her day in school”, “You drive your child to a special activity”, and “You attend PTA meetings, parent teacher conferences, or other meetings at your child’s school”. Cronbach’s alphas were .85, .85, and .84 at T1, T2, and T3, respectively. The *positive parenting practices* scale (Frick et al., 1999) consisted of six items tapping parents’ general positive behaviors in relation to their child. Parents rated how often different situations took place, such as: “You reward or give something extra to your child for obeying you or behaving well”, “You compliment your child when he or she does something well”, and “You hug or kiss your child when he or she has done something well”. Cronbach’s alphas were .82, .81, and .86 at T1, T2, and T3, respectively. Finally, the *discussion during punishment* scale included three items that were developed for the project. The purpose of this measure was to capture parents’ communication about the consequences of the child’s actions—a practice that is believed to promote internalization of values and positive behavior (Hoffman & Saltzstein, 1967). Parents were asked “How often does each of the following occur in your home when your child misbehaves” along with three statements: “You encourage your child to talk about his or her misbehavior”, “You try to discuss with your child reasons for his or her behavior”, and “You encourage your child to express his or her emotions”. Cronbach’s alphas were .70, .78, and .79 at T1, T2, and T3, respectively. The response options on all three scales ranged from 1 (*Never*) to 5 (*Always*).

Adolescents’ externalizing. We used adolescents’ self-reports of three different types of externalizing (Galambos & Maggs, 1991), as indicators of an overall externalizing latent variable. Similar adolescent reported measures have been used in earlier studies (e.g., Dumka et al., 2010), and have been related both to parenting practices and PSE. Adolescents reported how often they had engaged in 28 behaviors that covered three areas: (a) disobedience toward parents

(seven items, e.g., “Stay out past curfew” and “Lie to parents”), (b) school misconduct (eight items, e.g., “Cut a class” and “Talk back to teachers”), and (c) antisocial behaviors (13 items, e.g., “Get into a physical fight” and “Damage property on purpose”). Response options ranged from 1 (*Never*) to 5 (*Very often*). Cronbach’s alphas were all above .69 at all time points.

Statistical Procedures

As a first step, we examined the association between demographic variables (ethnicity, child’s sex, family income, parents’ education, family structure), and the focal independent and dependent variables. Demographic variables that were significantly related to focal independent and dependent variables were controlled in further analyses.

To test the theoretical processes we performed Structural Equation Modeling (SEM) using Mplus 7.11 (Muthén & Muthén, 1998-2012), with the Maximum Likelihood estimator. Three indices were used to evaluate model fit: the Comparative Fit Index, (CFI), the Tucker-Lewis Index (TLI), and the Root Mean Square Error of Approximation, (RMSEA). CFI and TLI values above .90 and RMSEA values of .06 or lower are considered indicators of an acceptable fit between the hypothesized model and the observed data (Hu & Bentler, 1999). To handle missing data, Full Information Maximum Likelihood was used.

To test the measurement models, we performed two Confirmatory Factor Analyses (CFAs), each including one of the two PSE measures, promotive parenting, and adolescents’ externalizing. As a first step, we fitted null models, which are models in which no covariances among the variables, means, or variances are estimated or allowed to be different over time; these are, thus, the worst fitting models and can be used as comparisons when examining factorial invariance. After this, we examined configural and weak factorial invariance of our constructs. If configural factorial invariance is reached, the same pattern of the indicator

loadings is found for the construct at all time points. Further, to reach weak factorial invariance, the loading of one factor indicator has to be equal over time. We used changes in CFI (with decreases of .01 representing a tolerable change) and RMSEA (with the value falling within the RMSEA CI for the other model representing a tolerable change) as guidelines for evaluating factorial invariance (Little, 2013).

To examine associations among the latent variables, we added structural paths to the measurement models. First, we tested baseline models including stability paths and concurrent associations among the latent variables. Thereafter, cross-lagged paths were estimated, testing for all possible over-time processes. We performed multiple group comparisons to test for differences between mothers and fathers. The multiple group comparisons were done by placing equality constraints on all cross-lagged paths, and thereafter, freeing one path at a time to examine if this significantly improved the χ^2 . After the group comparisons, and to obtain the most parsimonious models, we set all non-significant cross-lagged paths to be equal to zero and examined changes in the model fit. If the models with the paths set to zero offered a non-significant increase in χ^2 , these models were kept. Finally, we tested indirect effects adapting the model indirect command of the Mplus language. We used bootstrap sampling method (Shrout & Bolger, 2002) (with $n = 1,000$) as it does not assume normal distributions and is suitable when using moderate sample sizes (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). In all analyses, we controlled for the plausible effect of intra-family dependency (the fact that some parents came from the same families and some did not).

Results

Descriptive Statistics

Zero-order correlations, means, and standard deviations are reported in Table 1. The two PSE measures were moderately correlated, indicating that they captured somewhat distinct but related concepts. Both PSE measures correlated positively with promotive parenting practices and negatively with adolescents' externalizing. Of the demographic variables, only family income was related significantly to study variables and controlled in further analyses.

Measurement Model

The fit statistics for all analytical steps are reported in Table 2. First, we compared the null models with the models testing for configural factorial invariance (Step 2). Second, we compared the configural models with the models testing for weak factorial invariance (Step 3). Comparing these models, the decreases in CFI were less than .01 and the RMSEA's of the models fell within each other's CI, suggesting that both configural and weak factorial invariance were reached for all measures.¹ We tested for equivalence of the measures across groups to assure that the same constructs were assessed for mothers and fathers. The results showed that this was the case. From these results we concluded that the properties of the measures used in this study were acceptable.

Over-time Associations Among PSE, Parenting Practices, and Adolescents' Externalizing

The models testing all cross-lagged paths showed a better fit to the data than did the models including only stability paths and concurrent associations (see Step 5 in Table 2), and these models were therefore used to test for differences between mothers and fathers (Step 6). Further, constraining all non-significant cross-lagged paths to be equal to zero did not result in significant drops in χ^2 (Step 7), and these results represent the most parsimonious way of describing the data. Standardized path coefficients from these final models are reported in

Figure 1. Because auto-aggressive paths were estimated, the results in the figures represent changes over time.

First, for the first PSE measure only, PSE predicted changes in promotive parenting practices between T1 and T2. However, a significant group difference indicated that this link was significant only among mothers. Second, for both PSE measures, promotive parenting predicted changes in PSE between T1 and T2, and it also predicted changes in externalizing over both developmental periods. Third, for both PSE measures, externalizing at T2 predicted changes in promotive parenting practices between T2 and T3, and adolescents' externalizing predicted changes in the first PSE measure between T2 and T3. Given the significant associations found, we tested the following possible indirect effects: (a) the first PSE-measure $\rightarrow$ promotive parenting practices $\rightarrow$ adolescents' externalizing (PSE-driven process), and (b) promotive parenting practices $\rightarrow$ adolescents' externalizing $\rightarrow$ the first PSE-measure (parent behavior-driven process). Only the first indirect effect was significant, and only for mothers ($\beta_{\text{indirect}} = .03$, $SE = .02$, $p = .048$, $CI = 0.00 - 0.06$). Hence, for mothers but not fathers, PSE predicted changes in adolescents' externalizing via changes in promotive parenting practices.

Discussion

In this study, we examined the associations among PSE, promotive parenting practices, and adolescents' externalizing behavior. A PSE-driven process, where PSE is proposed to influence children's behaviors directly or via promotive parenting practices, has received most theoretical and empirical emphasis in past research (for reviews, see Coleman & Karraker, 1997; Jones & Prinz, 2005). Yet theory (Bandura, 1986, 1997) proposes that child-driven and parent behavior-driven processes also exist. Because most empirical tests of the associations among PSE, parenting, and children's behaviors have been conducted with one-time correlational designs or

with longitudinal designs that do not include all constructs at all times of measurement, it is unclear to what extent the PSE-driven process (typically assumed) versus other processes accounts for the associations. In this study we measured all three constructs at each of three waves over three years for mothers and fathers and their children in early to middle adolescence. Thus, this study is the first of which we are aware to examine PSE-driven, parent behavior-driven, and child-driven processes with respect to PSE, parenting, and adolescents' behavior. As such, this study plays a critical role in advancing theory concerning how these constructs are related over time, at least during early to middle adolescence.

Our results supported a PSE-driven process among mothers but not among fathers. Additionally, in accordance with theorizing about reciprocity between parents and children (e.g., Kuczynski, 2003; Lollis & Kuczynski, 1997), the findings also partly supported both parent behavior-driven and child-driven processes. Different processes, however, took precedence during different portions of the developmental period covered in this study. Parent behavior- and PSE-driven processes were prominent within early adolescence (T1-T2), whereas a child-driven process took place only between early and middle adolescence (T2-T3). Overall, the findings suggest that when conceptualizing how PSE is related to parents and children's behaviors in early-to-middle adolescence, it is necessary to take into account the active role of both parents and adolescents as well as parents' sex. Unexpectedly, the measure of PSE also mattered, with the first PSE measure showing the most significant associations with child and parent behaviors.

For mothers, the first PSE measure predicted changes in adolescents' externalizing, but only via promotive parenting practices (not directly). This result is consistent with the *PSE-driven process* that has been the focus of theory (Bandura, 1977) and much previous research (although typically with more limited research designs). Hence, even at a time when parental

influence is often believed to decline, and when PSE is at a nadir, mothers' confidence in handling the tasks involved in parenting young adolescents affects the likelihood that they report use promotive parenting practices, which in turn predicts more positive adjustment in the form of lower externalizing. For fathers, PSE was not significantly linked to changes in promotive parenting strategies. One possible explanation for this finding has to do with the measure of parenting we used. Mothers might be more involved in these specific behaviors than are fathers, and therefore their PSE might be more strongly related to such parenting practices than are fathers' PSE. Fathers' PSE has, instead, been associated with fathers' exertion of control (Murdock, 2012), suggesting that among fathers, PSE might be more strongly linked to practices aiming at disciplining or correcting the child than to behaviors similar to those used in this study.

Despite earlier empirical evidence of a direct link between PSE and child behavior, in this study, we argued that such link might be unlikely as this implies that one person's behavior is directly affected by another person's beliefs. Rather, we argued that PSE should be linked to children's behavior via promotive parenting practices. Consistent with this expectation, when testing the direct and indirect effects in the same model, PSE did not predict changes in adolescents' behavior directly. Additionally, only one of the earlier studies (Dumka et al., 2010) included adolescents, specifically Mexican American young adolescents, and their parents. The link between PSE and adolescents' behaviors was explained as a process of role modeling where adolescents adopt their parents' efficacious beliefs, which in turn has a positive effect on adolescents' adjustment. It is possible that a direct process of PSE on children's behavior is more likely among Latino adolescents than among European American or African American adolescents. The concept of "familismo", which describes the importance of keeping close bonds within the family, fulfilling family obligations, and supporting each other in the family, is

a salient cultural value among Latino families (e.g., Dumka et al., 2010; Niemeyer, Wong, & Westerhaus, 2009). Given the emphasis on the family, Latino adolescents might be especially sensitive or open to the direct transmission of their parents' beliefs, such as those concerning self-efficacy. In other words, family modeling might play a more powerful role for Latino teens than for European American and African American teens, who participated in the current study.

According to the *parent behavior-driven process*, what parents do should be linked to their beliefs via the effectiveness of these practices on children's adjustment. Our results did not support this entire process (promotive parenting practices → child behaviors → PSE) within the developmental period studied, even though each of the separate processes received independent support. Promotive parenting practices did predict changes in PSE, but did so directly, suggesting that the use of possibly effective parenting practices might promote more positive thinking about one's ability to deal with parenting tasks and influence children positively. Furthermore, more promotive parenting practices predicted less adolescent externalizing over both developmental periods. This latter result is consistent with other research (e.g., Galambos et al., 2003; Vandell, 2000), showing that parenting matters for adolescents' behaviors.

As expected, we also found evidence for the child-driven process. Adolescents' externalizing at T2 predicted subsequent changes in the first PSE-measure and in promotive parenting practices. This finding is in line with earlier studies (Slagt et al., 2012; Teti & Gelfand, 1991) showing that PSE is at least partially determined by child behaviors, and is an important addition to existing evidence demonstrating that this might be true across developmental periods (infancy, childhood, and adolescence). Additionally, similar results have been shown using other parental competence measures. For example, difficult child and adolescent behaviors have been linked to parents' feelings of powerlessness (e.g., Bugental,

Lewis, Lin, Lyon, & Kopeikin, 1999; Glatz & Stattin, 2013; Glatz, Stattin, & Kerr, 2011).

Interestingly, however, we did not find a child-driven effect within early adolescence (between T1 and T2), suggesting the possibility of shorter-term fluctuation in the prominence of parent-driven versus child-driven processes with respect to these particular constructs. Early in adolescence, when children have less independence and externalizing is low overall, parent-driven processes might take precedence. As adolescents get older and gain more independence, and as externalizing increases and becomes more variable across adolescents, this aspect of the adolescents' behavior might become more influential. Thus, our findings showing a PSE-driven process taking precedence within early adolescence and a child-driven process taking precedence a bit later—between early and middle adolescence—might reflect developmental changes in parent versus child effects, but might also be a function of the particular behavior we studied.

In line with earlier research, we hypothesized that adolescents' externalizing would be more strongly linked to PSE among mothers than among fathers, due to sex differences in involvement in caregiving (Phares et al., 2009), and in sensitivity to non-verbal cues from children (e.g., Brody & Hall, 2000). Contrary to our expectations, however, we found that adolescents' externalizing predicted PSE in a similar way for mothers and fathers. In some of the earlier studies that found stronger links among mothers than fathers, the authors used general PSE measures rather than task-specific measures (Murdock, 2012; Slagt et al., 2012). In this study, we used task-specific measures, and it is possible that children's behaviors more strongly predict fathers' beliefs about being able to handle specific tasks concerning their children's behaviors than their general beliefs about parental influence. Hence, the characteristic of the PSE measure in our study might explain the similar association between adolescents' behavior

and mothers and fathers' PSE, but further research to more thoroughly explore the role of parents' sex in child-driven processes seems important for the development of theory.

In this study, we used two PSE measures and there were more significant links among PSE, promotive parenting practices, and adolescents' externalizing for the first PSE measure than for the second. Although both measures have been argued to assess perceived parental efficacy and competence, these findings, as well as the moderate association between the constructs, led us to reflect on how they differed. We note two potentially important differences between the measures. First, there is a difference in the context of situations and behaviors assessed. The measure by Ballenski and Cook (1982) focuses on PSE concerning situations and behaviors mostly taking place *inside* the home environment, whereas the measure by Freedman-Doan and colleagues (1993) focuses on children's school achievement and activities *outside* of the home environment (e.g., "getting in with the wrong crowd"). Perhaps parents' efficacy about situations and behaviors in contexts where they have direct interactions and are present (i.e., inside the home) is more strongly linked to their parenting practices than is parents' efficacy about situations and contexts where they are not typically present. A second difference between the measures is in the wording that were used to reference "efficacy". The first measure asked how *comfortable* parents felt in dealing with different adolescent behaviors, and the second measure asked how much parents felt they could *influence* their adolescents' behaviors. Perhaps *comfort* addressing specific behaviors is a better predictor of promotive parenting than is beliefs about *influence*. Because no previous study of which we are aware has systematically explored different types of task-specific PSE measures, either theoretically or empirically, this study offers important information about the construct of PSE. The findings illuminate a need for closer examination of PSE measures with respect to context referenced and efficacy-related wording.

Limitations, Strengths, and Implications

Limitations of this study include that only 115 fathers participated. Even if this was enough to examine the questions of this study, it constrained us from testing further questions of interest, such as other possible moderators of the associations of interest. For example, parents might react differently to externalizing in boys and girls, given gender-role attitudes (e.g., Kingsbury & Coplan, 2012), but we did not have enough power to examine both parents' and adolescents' sex as moderators of the associations. Additionally, because this study included far fewer fathers than mothers, and because unequal sample sizes might increase the risk of making a type-2 error if there is a large difference in the variances between the groups, the results concerning the sex differences should be interpreted with some caution. A second limitation is the different time spans between the data collections, which might have influenced the results. Between T1 and T2 there was one year, and between T2 and T3 there were two years. For some processes, a one-year span might be too short. For example, all child effects occurred over the second developmental period, suggesting that adolescents might have increasing influence on their parents as they move from early to middle adolescence. However, it is also possible that child effects involving the constructs that we studied take longer to emerge than do parent effects. Finally, it should be noted that the developmental period examined in this study was restricted to early and middle adolescence. Therefore, the results illuminate parent-child processes during this specific period only, and different processes might take place before and after this period.

This study also had several strengths. First, we used longitudinal data, including all variables at all time points. As this has not been done before to our knowledge, the results offer crucial information about the over-time processes among the constructs. Although the data in

this study were correlational, it satisfied the condition of time precedence, and the results from the cross-lagged panel analyses illuminate the potential direction of influence between the variables (MacKinnon, 2008). Second, in this study we used multiple reporters: parents' reports of PSE and promoting parenting, but adolescents' reports about their externalizing. Parents' reports about their children's behaviors might be influenced by their level of efficacy, in that parents who doubt their abilities might overrate their children's problematic behaviors (Jones & Prinz, 2005). Because we used adolescents' reports of externalizing, parents' cognitive processes should not bias the associations between adolescents' externalizing and PSE or parenting practices. Third, latent variables were used throughout this study. Observed variables have been favored over latent variables, but the use of latent variables enables examinations of the over-time associations while correcting for measurement errors in the indicators. To summarize, in this study we overcame some of the most common methodological and analytical issues that have been present in earlier studies. The results, therefore, represent an important step towards a greater theoretical understanding about how PSE is linked to parents' and adolescents' behaviors.

In addition to their theoretical implications, the findings also have educational and clinical implications. They speak to the relevance of educating and encouraging parents about their continuing influence as children enter and develop through adolescence. This is important because of abundant cultural messages about adolescents that can cause parents to question their efficacy (Buchanan & Holmbeck, 1998). These messages have the potential to produce a self-fulfilling prophecy if they lead to lower efficacy, less promotive parenting, and subsequently more stereotypical (externalizing) adolescent behavior (Buchanan & Hughes, 2009). The findings also suggest that it might be important for parent education programs to target different

aspects of the parenting role for mothers and fathers. Mothers' promotive parenting of adolescents (at least as operationalized here) might more easily be compromised as a result of not feeling efficacious in parenting of their adolescents than might fathers' parenting. Thus, it might be especially crucial to help mothers maintain their parenting efficacy as children become older and more independent. For fathers, it might be more important to focus on parenting practices directly, as the results showed that PSE did not predict changes in fathers' promotive parenting practices, but their promotive practices did matter for adolescents' adjustment. In the end, it is probably positive to help all parents increase their self-efficacy, but doing so might not be equally effective for both mothers and father, nor for children at all times in development.

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Footnotes

¹ The externalizing measure originally included a fourth scale: adolescents' substance use. This scale showed low internal reliability at T1 and did not reach weak factorial invariance. Hence, it did not load as strongly on the latent variables at all time points. Specifically, it loaded more weakly on the latent variable at T1, and more strongly at later time points. Compared to the behaviors measured by the other indicators, adolescents' substance use might be at a lower point at T1, and increase more over this developmental period. Therefore, it is not surprising that the substance use indicator loaded differently on the overall externalizing latent variable over time., We ran all analyses with this scale included and the associations among the latent variables were the same as those reported in this study, but to establish acceptable measurement models before examining the structural paths, this scale was excluded in all analyses reported.

Table 1

Zero-order correlations, means and standard deviations among all study variables.

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	<i>M</i>	<i>SD</i>
1. In PSE T1	.	.65*	.42*	.40*	.33*	.09	.34*	.21*	.04	-.08	-.06	-.20	4.59	0.84
2. In PSE T2	.64*	.	.63*	.42*	.53*	.14	.39*	.37*	.36*	-.28*	-.30*	-.22*	4.52	0.78
3. In PSE T3	.56*	.65*	.	.14	.32*	.33*	.16	.32*	.35*	-.21	-.27*	-.09*	4.59	0.82
4. Out PSE T1	.40*	.18*	.10	.	.65*	.31*	.46*	.36*	.17	-.38*	-.31*	-.31*	5.75	0.87
5. Out PSE T2	.43*	.32*	.22*	.48*	.	.54*	.41*	.33*	.37*	-.39*	-.33*	-.43*	5.50	0.99
6. Out PSE T3	.21*	.21*	.36*	.25*	.39*	.	.17	.21	.39*	-.17	-.24	-.27*	5.44	1.09
7. Promotive T1	.29*	.28*	.39*	.29*	.31*	.21*	.	.78*	.58*	-.17	-.17	-.20	4.04	0.40
8. Promotive T2	.36*	.35*	.34*	.27*	.39*	.26*	.82*	.	.69*	-.21*	-.32*	-.28*	3.91	0.37
9. Promotive T3	.19*	.32*	.39*	.10	.29*	.29*	.67*	.69*	.	-.14	-.27*	-.29*	3.88	0.45
10. Extern T1	-.18*	-.20*	-.18*	-.19*	-.21*	-.22*	-.13*	-.14*	-.16*	.	.76*	.41*	1.39	0.28
11. Extern T2	-.14*	-.13*	-.17*	-.19*	-.17*	-.16*	-.22*	-.16*	-.17*	.68*	.	.52*	1.44	0.30
12. Extern T3	-.01	-.05	-.22*	-.04	-.21*	-.21*	-.36*	-.23*	-.25*	.45*	.61*	.	1.66	0.55
<i>M</i>	4.51	4.50	4.37	5.85	5.78	5.47	4.24	4.12	4.01	1.44	1.52	1.71	-	-
<i>SD</i>	0.84	0.80	0.77	0.91	0.83	1.16	0.41	0.43	0.48	0.32	0.34	0.52	-	-

Note. Values for fathers above the diagonal and for mothers below the diagonal. Mother $n = 286$, Father $n = 115$.

* $p < .05$

Table 2

Model fit indices.

Model	$\chi^2 (df)$	CFI	TLI	RMSEA (90% CI)	$\Delta\chi^2 (df)$	$\Delta\chi^2 p$
First PSE-measure						
1. Null model	5244.031 (351)					
2. Configural factorial invariance	359.624 (261)	.980	.973	0.031 (0.022, 0.038)		
3. Weak factorial invariance	399.375 (273)	.974	.967	0.034 (0.027, 0.041)		
4. Model with stability paths and concurrent associations among latent variables	464.871 (294)	.965	.958	0.038 (0.031, 0.045)		
5. Cross-lagged panel model Δ Model 4	410.562 (282)	.974	.967	0.034 (0.026, 0.041)	54.309 (12)	< .001
6. Model with cross-lagged paths – only significant equality constraints	1063.665 (712)	.931	.921	0.050 (0.043, 0.056)		
7. Most parsimonious model Δ Model 6	1076.107 (720)	.930	.921	0.050 (0.043, 0.056)	12.442 (8)	.133
Second PSE-measure						
1. Null model	4939.875 (351)					
2. Configural factorial invariance	382.371 (261)	.974	.964	0.034 (0.026, 0.041)		
3. Weak factorial invariance	413.626 (273)	.969	.961	0.036 (0.029, 0.043)		
4. Model with stability paths and concurrent associations among latent variables	470.037 (294)	.962	.954	0.039 (0.032, 0.045)		
5. Cross-lagged panel model Δ Model 4	424.365 (282)	.969	.961	0.035 (0.028, 0.042)	45.672 (12)	<.001
6. Model with cross-lagged paths – only significant equality constraints	1045.289 (712)	.930	.920	0.048 (0.042, 0.054)		
7. Most parsimonious model Δ Model 6	1050.485 (720)	.931	.922	0.048 (0.041, 0.054)	5.196 (8)	.736

Figure 1. Significant standardized regression coefficients for the first PSE-measure (above) and for the second PSE-measure (below) (mothers / fathers). Promotive = promotive parenting practices. ^a = estimate differ significantly between mothers and fathers. ^b = path not significant and, therefore, set to be equal to zero. Within-time and over-time associations and autoregressive paths were estimated, and family income was included as a control variable. All autoregressive coefficients were large, indicating high stability in the constructs being measured.

* $p < .05$, ** $p < .01$, *** $p < .001$