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Siblings' Perceptions of Differential Treatment, Fairness, and Jealousy and Adolescent Adjustment: A Moderated Indirect Effects Model

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Abstract

Youth's perception of parents' differential treatment (PDT) are associated with maladjustment during adolescence. Although the direct relations between PDT and youth's maladjustment have been well established, the mechanisms underlying these associations remain unclear. We addressed this gap by examining whether sibling jealousy accounted for the links between PDT and youth's depressive symptoms, self-worth, and risky behaviors. Additionally, we examined whether youth's perceptions of fairness regarding their treatment as well as the gender constellation of the dyad moderated these indirect relations (i.e., moderated-indirect effects). Participants were first- and second-born adolescent siblings ($M = 15.96$, $SD = .72$ years for older siblings, $M = 13.48$, $SD = 1.02$ years for younger siblings) and their parents from 197 working and middle class European American families. Data were collected via home interviews. A series of Conditional Process Analyses revealed significant indirect effects of PDT through sibling jealousy to all three adjustment outcomes. Furthermore, perceptions of fairness moderated the relations between PDT and jealousy, such that the indirect effects were only significant at low ($-1 SD$) and average levels of fairness. At high levels of fairness ($+1 SD$) there was no association between PDT, jealousy, and youth adjustment. Taken together, results indicate that youth and parents would benefit from engaging in clear communication regarding the reasoning for the occurrence of differential treatment, likely maximizing youth and parent perceptions of that treatment as being fair, and in turn mitigating sibling jealousy and maladjustment.

Keywords

Perceived Differential Treatment; Siblings; Jealousy; Adolescence; Moderated-Indirect Effects

Introduction

In the face of an ideal of equality (Parsons, 1974/1942), many parents treat their children differently. Research suggests that children and adolescents are keenly aware of the behaviors parents direct towards them versus their siblings, particularly when these behaviors are identified as being different for each child (Daniels & Plomin, 1985; Hart & Legerstee, 2010). Parents endorse various reasons for treating their children differently, including differences in children's ages and developmental needs (Brody, Stoneman, & Burke, 1987; Kowal & Kramer, 1997; McHale & Pawletko, 1992). Importantly, however, youths' perceptions of parents' differential treatment (PDT) are related to a range of adjustment outcomes throughout childhood and adolescence (McHale, Updegraff, Jackson-Newsom, Tucker, & Crouter, 2000; Meunier, Bisceglia, & Jenkins, 2012).

One theoretical framework that often has been invoked to explain the implications of PDT is Social Comparison Theory (SCT; Festinger, 1954). This theory holds that individuals are motivated to compare themselves to others in order to learn about and evaluate aspects of the self (Suls, Martin, & Wheeler, 2002). Through these comparisons, children begin to develop a sense of self and associated feelings of self-worth (Feinberg, Neiderhiser, Simmens, Reiss, & Hetherington, 2000). In general, self-esteem is thought to be enhanced by downward comparisons (i.e., comparisons made with those with less favorable experiences or performance) and negatively impacted by upward comparisons (i.e., comparisons made with those with more positive experiences or performance; Mendes, Blascovich, Major, & Seery, 2001; Wheeler & Miyake, 1992). In fact, social comparisons are especially important during adolescence, as developmental changes in cognition and perspective taking are associated with youth's increased utilization of comparisons for self-evaluation (e.g., Eccles, Midgely, & Adler, 1984; Ruble, Boggiano, Feldman, & Loebl, 1980). Adolescence is further characterized as a transitional period when identity formation and development of the self are central tasks (Erikson, 1959; Schulenberg & Maggs, 1999). As such, it is important to understand how youth's comparisons of parents' treatment of themselves and their siblings are related to their self-evaluations, including constructs such as self-worth and depression.

Consistent with SCT principles, extant work shows youth who receive more favorable parental treatment than their siblings exhibit more positive adjustment outcomes, ranging from higher self-worth to lower levels of risk-taking behaviors (Feinberg & Hetherington, 2001; Shanahan, McHale, Crouter, & Osgood, 2008; Shebloski, Conger, & Widaman, 2005). Further, in the case of siblings, some work shows that youth with lower self-worth tend to compare themselves to their brothers/sisters more frequently than those with higher self-worth (Feinberg et al., 2000). Although SCT provides a framework for understanding the relations between PDT and youth's outcomes, the mechanisms or pathways are not well established. We posit that the links between PDT and adolescents' adjustment operate through siblings' feelings of jealousy. Jealousy is defined as an emotional, behavioral, or affective response in which an individual may be envious or resentful of something that another person has garnered (e.g., parental attention), achieved (e.g., better grades), or may be better at than themselves (e.g., extracurricular activities). Furthermore, jealousy can occur as a result of a perceived or real experience (e.g., PDT), and typically occurs within a triadic context, whereby jealousy can arise between two individuals due to a third person, an object, and/or a

characteristic (Legerstee, Ellenbogen, Niehhuys, & Marsh, 2013; Volling et al., 2013). Indeed, research incorporating social comparisons and feelings of jealousy suggests that when individuals perceive targets as more competent or privileged (in the case of siblings and PDT, for example, privilege may include more affection, time, or intimacy from parents), they feel greater jealousy towards those comparison targets (Salovey, 1991; Salovey & Rodin, 1984). Furthermore, jealousy is prevalent in most sibling relationships and can occur beginning at an early age (Parker, Low, Walker, & Gamm, 2005; Tseung & Schott, 2004; Volling, Kennedy, & Jackey, 2013). One study of sibling jealousy during middle childhood and adolescence, for example, found that approximately 98% of youth reported experiencing sibling jealousy at least once (Thompson & Halberstadt, 2008). Additionally, consistent with SCT tenets, research has documented that differential parental attention and favoritism were related to feelings of sibling jealousy (Thompson & Halberstadt, 2008; Tseung & Schott, 2004). Despite the direct links between PDT and youth's feelings of jealousy, researchers have yet to investigate how jealousy operates in PDT—youth's adjustment linkages. In the present study, we tested youth's feelings of jealousy toward their sibling as a component in the process of PDT's indirect effect on youth's adjustment.

Although research has documented direct links between PDT and adolescent siblings' adjustment, scholars have shown that individuals' perceptions of fairness about this treatment are a critical moderator (Kowal & Kramer, 1997; McHale et al., 2000). Youth who reported being disfavored and perceived this treatment as unfair were especially at risk for experiencing negative outcomes, including more internalizing and externalizing problems (Kowal & Kramer, 1997; Kowal et al., 2002). In contrast, disfavored treatment that was considered fair was unrelated to youth's overall adjustment (Kowal et al., 2002). Additionally, research on differential treatment in families in which one child has special needs shows that children are aware of the differences in treatment they receive; however, these children report a greater understanding about the rationale for their parents' differential treatment as well as identifying the experience as being more fair (McHale & Pawletko, 1992).

In addition to perceptions of fairness, theory and research also indicate that the gender constellation of the sibling dyad may moderate the relations between PDT and jealousy (Goodwin & Roscoe, 1990; McHale et al., 2000; Parker et al., 2005). According to SCT, youth most frequently compare themselves to individuals with whom they are similar (Wheeler et al., 1969). In addition to highlighting the role of siblings in general as sources of social comparison, this tenet implies that sharing a characteristic such as gender will also motivate social comparison. As such, youth in same-gender sibling dyads may compare themselves more frequently and those comparisons may therefore have stronger implications for adjustment than those of youth from mixed-gender dyads.

Addressing a gap in the literature on PDT on the processes through which this family dynamic has implications for youth's adjustment, the present study investigated whether mothers' and fathers' differential treatment was indirectly linked to youth adjustment (i.e., depressive symptoms, self-worth, and risky behaviors) by virtue of its effects on youth's feelings of jealousy. Additionally, we explored whether youth's perceptions of the fairness of PDT and/or sibling dyad gender constellation moderated the relations between PDT and

jealousy, and in turn, the indirect pathway linking PDT to youth's adjustment. In line with previous research, we expected that disfavored treatment would be negatively associated with youth's self-worth and positively linked to youth's depressive symptoms and risky behavior. Further, we tested the prediction that PDT would be positively related to youth's reports of sibling jealousy. Finally, we hypothesized that sibling jealousy would be negatively associated with self-worth and positively associated with depressive symptoms and risk-taking behaviors. In addition to these direct effects, we predicted that there would be an indirect effect of PDT on adolescents' adjustment through its effects on jealousy. Specifically, we predicted that disfavored treatment would be positively related to jealousy, which in turn would be negatively related to self-worth and positively related to depressive symptoms and risk-taking behaviors. Furthermore, perceptions of fairness were expected to moderate the effect of PDT on jealousy, such that, when PDT was perceived as unfair, reports of PDT would be positively related to reports of jealousy and, in turn, positively related to depressive symptoms and risk-taking behaviors, and negatively related to self-worth. Perceptions that PDT was fair, however, were expected to mitigate the links between PDT, jealousy, and youth's adjustment problems. We also expected that sibling dyad gender constellation would moderate the links between PDT and jealousy such that disfavored treatment would be more strongly related to sibling jealousy in same-gender as compared to mixed-gender dyads and the indirect path from PDT to youth's adjustment through jealousy would also be stronger for same-gender dyads.

Method

Participants

The data came from a short-term longitudinal study of gender development during adolescence. For this study, data were drawn from the second wave, the occasion of measurement in which the measures of interest were collected. Participants included 394 first- and second-born adolescent siblings ($M = 15.96$, $SD = .72$ years for older siblings, $M = 13.48$, $SD = 1.02$ years for younger siblings) and their mothers ($M = 39.37$ years of age, $SD = 3.90$) and fathers ($M = 41.30$ years of age, $SD = 4.23$) from 197 families. The sample included approximately equal number of dyads across the gender-constellation groups: same-gender ($N = 98$), mixed-gender ($N = 95$) with gender being distributed fairly evenly across older and younger siblings ($N = 90$ older sisters, $N = 107$ older brothers, $N = 98$ younger sisters, and $N = 99$ younger brothers). Family size was consistent with U.S. norms, as the majority of families (90%) included two or three offspring ($M = 2.58$, $SD = .80$, range: 2 to 7 children). Ninety-seven percent of the sample was White. On average, parents had completed some college ($M = 14.34$, $SD = 2.12$ for mothers and $M = 14.23$, $SD = 2.30$ for fathers; 12 = *high school graduate* to 18 = *Ph.D., professional degree*) and average family income was \$63,441 ($SD = \$26,884$).

Procedure

Participants were recruited via letters sent to families living in 18 rural and urban school districts in a northeastern state. Interested families responded via returning a self-addressed postcard, after which follow up telephone interviews were conducted to verify the interested families met the study requirements. Criteria included having a firstborn child in the 8th, 9th,

or 10th grade; having a second-born child between one and four years younger than the firstborn; and having an always-married, two parent household.

Mothers, fathers, and both siblings were interviewed separately in their homes. The interviews began with obtaining informed consent/assent from each family member. Interviews were then conducted separately for adolescents and parents, each lasting between one (for adolescents) and three hours (for parents). During these interviews family members reported on personal attributes, adjustment, and family relationship qualities. Families received an honorarium of \$100 for their participation.

Measures

Perceived Differential Treatment—Using an adapted version of the Sibling Inventory of Differential Experience (SIDE; Daniels & Plomin, 1985), both adolescent siblings reported on the degree to which they perceived differential treatment from mothers and fathers over the past year across six domains: chores, privileges, conflict, affection, punishment, and time. In total, this scale included 10 items, with the last four domains being rated separately for mothers and fathers. Sample items included, “Who has more privileges like getting to do more fun things, going to friends’ houses, or staying up later?” “Who does more chores?” and “Who does your mother/father spend more time with?” Responses were rated on a five-point scale (1 = *Younger sibling more*, 2 = *Younger sibling somewhat more*, 3 = *Equal treatment*, 4 = *Older sibling somewhat more*, 5 = *Older sibling more*). In order to calculate disfavored treatment, for each item, scores were recoded to indicate whether youth were disfavored (1) or treated equally/favored (0), and total disfavored treatment was summed across all 10 domains. Thus, scores reflected the total number of domains in which youth experienced disfavored treatment, with a possible range from 0 – 10 ($M = 2.51$, $SD = 1.73$, for younger siblings; $M = 3.25$, $SD = 1.71$, for older siblings). A paired samples t -test indicated that older siblings reported more disfavored treatment than younger siblings ($t = 4.18$, $p < .001$).

Fairness—Youth's perceptions of fairness regarding parental differential treatment were assessed using adolescents' reports across the 10 differential treatment items (i.e., chores and privileges and conflict, affection, punishment, and time for mothers and for fathers). Specifically, following their rating of differential treatment in each domain, youth were asked how fair they thought that treatment was. For example, youth were asked, “How fair do you think it is that your mother/father spends more time with you/your sibling/you both equally?” And, “How fair do you think it is that your mother/father punishes you more/sibling more/you both equally?” Responses were rated on a three-point scale (1 = *not fair*, 2 = *somewhat fair*, 3 = *very fair*). Scores were averaged across the domains with higher scores indicating greater fairness ($M = 2.36$, $SD = .42$, $\alpha = .81$, for younger siblings; $M = 2.36$, $SD = .37$, $\alpha = .75$, for older siblings). A paired samples t -test indicated that there were no differences between older and younger siblings' ratings of fairness ($t = .12$, ns).

Sibling Jealousy—Immediately following their assessment of fairness, on a four-point Likert scale (1 = Not at all jealous, 2 = A little jealous, 3 = Somewhat jealous, 4 = Very jealous) youth rated how jealous they were of their siblings' treatment in each of the 10

differential treatment items over the past year. Items included “How jealous or annoyed do you feel about how affectionate your mother/father is to you compared to (Sibling)?” and “How jealous or annoyed do you feel about the kinds of privileges you and (Sibling) are given?” Scores were averaged across the items with higher scores denoting greater jealousy and means suggesting that youth averaged in the not at all to a little jealous range ($M = 1.43$, $SD = .44$, $\alpha = .79$, for younger siblings; $M = 1.48$, $SD = .44$, $\alpha = .79$, for older siblings). A paired samples t -tests revealed no differences between older and younger siblings’ ratings of jealousy ($t = 1.08$, ns).

Depressive Symptoms—Youth's depressive symptoms were assessed using 12 items adapted from the Center for Epidemiological Studies Depression inventory (CESD; Radloff, 1977), which were rated on a 4-point scale (1 = *Rarely or none of the time*; 2 = *Some of little of the time*; 3 = *Occasionally or moderate amount of time*; 4 = *Most or all of the time*). Youth were asked to reflect on how often they felt or behaved in a certain way during the past week. Sample items included “I felt depressed” and “I felt lonely.” Scores were obtained via summing the responses for a possible range of 12 to 48 ($M = 21.61$, $SD = 5.73$, $\alpha = .90$, for younger siblings; $M = 21.30$, $SD = 5.56$, $\alpha = .82$, for older siblings).

Self-Worth—Self-worth was assessed using a five-item subscale of the Self-Perception Profile for Adolescents (Harter, 1982). For each of the five items, youth were given one positive and one negative description of teenagers and were asked to identify which best described them (e.g. “Some teenagers like the kind of person they are,” or “Other teenagers often wish they were someone else”). Youth were then asked to rate whether the statement was “sort of true” of them or “really true” of them. Overall scores were calculated using the mean of the five items with scores ranging from 1 to 4 ($M = 3.15$, $SD = .67$, $\alpha = .83$, for younger siblings; $M = 3.14$, $SD = .65$, $\alpha = .85$, for older siblings) and higher scores denoting greater self-worth.

Risky Behavior—Youth's participation in risky behaviors was assessed using 18 items from Eccles and Barber (1990). Youth were asked to indicate how often they had engaged in each of the behaviors during the past year. Sample items included: “Skip a day of school,” “Get drunk,” and “Smoke cigarettes.” Items were rated on a four-point scale (1 = *Never*; 2 = *Once*; 3 = *Sometimes--2-10 times*; 4 = *More than 10 times*) with scores ranging from 18 to 72 ($M = 24.35$, $SD = 7.51$, $\alpha = .90$, for younger siblings; $M = 26.72$, $SD = 7.66$, $\alpha = .87$, for older siblings).

Parent-Adolescent Conflict—Parent-adolescent conflict was assessed using a measure adapted from Smetana (1988), which assessed the frequency of conflict across 12 domains (e.g., chores, social life, and romantic relationships) in the past year. On a 6-point scale (1 = *not at all* to 6 = *several times a day*), mothers and fathers rated the frequency of conflict with each of their children separately. Scores were summed across the items (*range* 14 – 49) with higher scores representing greater conflict frequency (Cronbach's α ranged from .79 - .83). Given the correlation between mothers’ and fathers’ reports of conflict ($r = .64$, $p < .001$) and in order to reduce the number of control variables in the models, mothers’ and fathers’

reports were averaged to provide a single index of parent-adolescent conflict per child ($M = 27.65$, $SD = 7.06$, for younger siblings; $M = 26.97$, $SD = 6.91$, for older siblings).

Parent-Adolescent Acceptance—Parents reported on their acceptance/responsiveness using 24 items from Schwarz, Barton-Henry, and Pruzinsky's (1985) revision of the parents' version of the Child's Report of Parental Behavior Inventory (CRPBI; Schaefer, 1965). Mothers and fathers rated their experiences with each of their children separately using a 5-point scale ranging from 1 (*not at all*) to 5 (*very much*). Sample items included: "I am a person who understands my child's problems and worries;" and, "I am a person who sees my child's good points more than his/her faults." Ratings were averaged, with higher scores indicating greater parent-youth acceptance (Cronbach's α ranged from .95 - .97). Similarly to the parent-adolescent conflict measures, given the correlation between parents' reports ($r = .42$, $p < .001$) and in order to reduce the number of control variables, mothers' and fathers' scores were averaged together ($M = 3.87$, $SD = .42$, for younger siblings; $M = 3.80$, $SD = .45$, for older siblings).

Data Analyses

In order to assess the relations between youth's perceptions of parental differential treatment, jealousy, and youth's adjustment, bivariate correlations were conducted. Then, the indirect effects of PDT on adolescents' adjustment through jealousy were analyzed using Conditional Process Analyses (Hayes, 2009; 2013) via SAS version 9.4. This analytic method incorporates a regression-based path analytic macro, which allows for the simultaneous testing of direct, indirect, and moderated effects. Initial models examined the indirect effects of PDT on adjustment outcomes through jealousy; a series of subsequent models tested whether the indirect effect of PDT on adolescents' adjustment through jealousy varied as a function of fairness perceptions or gender constellation of the dyad (i.e., moderated indirect effects; Hayes, 2009; 2013). Ten thousand bootstrapped samples were used to calculate the confidence intervals for the indirect effects. Standardized estimates for all models were obtained by standardizing variables and rerunning all analyses. Finally, in order to account for the clustered nature of the data from older and younger siblings in each family, the cluster command was used (Hayes, 2009; 2013) with birth ordering serving as the cluster variable. Although parameter estimates are not provided for this variable, the models effectively control for the effects of the clustered variable (i.e., birth order) in addition to all other control variables (Hayes, 2009).

Results

As can be seen in Table 1, consistent with hypotheses, youth's reports of disfavored treatment were positively correlated with depressive symptoms, risk-taking behaviors, and jealousy, as well as negatively correlated with self-worth. Reports of jealousy were positively correlated with depressive symptoms and risk-taking behaviors, and negatively correlated with self-worth and fairness. Additionally, depressive symptoms and risky behaviors were positively correlated and negatively correlated with self-worth.

Table 2 presents the direct effects of all control variables and explanatory variables on youth's adjustment outcomes. Controlling for youth's age, age spacing of the dyad, youth's

gender, family size, parents' socioeconomic status, and parent-adolescent relationship qualities, initial models revealed significant indirect effects of PDT through jealousy to youth's depressive symptoms ($b = .23$, $SE = .09$, 95% $CI [.07, .43]$, $\beta = .07$), risk-taking behaviors ($b = .29$, $SE = .11$, 95% $CI [.10, .55]$, $\beta = .07$), and self-worth ($b = -.04$, $SE = .01$, 95% $CI [-.06, -.01]$, $\beta = -.10$). These results indicated that adolescents who reported disfavored treatment also reported greater jealousy and, in turn, lower self-worth, more depressive symptoms and more risk-taking behaviors than those who reported equal or favored treatment. Importantly, despite significant bivariate correlations (see Table 1), the direct effects of PDT on depressive symptoms and self-worth were not significant when ratings of jealousy were included. Notwithstanding, there was a significant direct effect of PDT on risk-taking behaviors ($b = .58$, $SE = .23$, $t = 2.52$, $p < .05$, $\beta = .13$), indicating that, although there was a significant effect through jealousy, it did not account for the entire association between PDT and risky behaviors.

In order to examine whether the indirect effects of disfavored treatment on adolescents' adjustment through jealousy were moderated by perceptions of fairness, the PDT X fairness interaction was tested first, with respect to the pathway from PDT to jealousy. This interaction was significant ($b = -.09$, $SE = .03$, $t = -3.39$, $p < .001$, $\beta = -.13$) indicating that the effect of PDT on jealousy was conditioned on fairness perceptions; therefore the indirect pathways from PDT to youth's adjustment indices may also be conditioned by the level of fairness. Following the procedures outlined by Aiken and West (1991), simple effects were probed at low (i.e., unfair, $-1 SD$), average (i.e., mean levels), and high ($1 SD$) levels of fairness. Consistent with expectations, there was a positive association between disfavored treatment and jealousy at low ($b = .08$, $SE = .01$, $t = 5.37$, $p < .001$, $\beta = .15$) and average ($b = .05$, $SE = .01$, $t = 4.18$, $p < .001$, $\beta = .08$) levels of fairness, but no relation at high ($b = .01$, $SE = .02$, $t = .98$, ns , $\beta = .03$) levels of fairness (see Figure 1). Furthermore, simple effects tests of the indirect effects indicated significant links from PDT to all three adjustment outcomes through jealousy at low and average fairness, but not high fairness. Specifically, for depressive symptoms, there was a significant indirect effect of PDT on youth's depressive symptoms through jealousy at low ($b = .17$, $SE = .08$, 95% $CI [.05, .39]$, $\beta = .05$) and average levels of fairness ($b = .10$, $SE = .05$, 95% $CI [.02, .24]$, $\beta = .03$), but not at high levels of fairness ($b = .03$, $SE = .04$, 95% $CI [-.02, .13]$, $\beta = .01$). As predicted, adolescents who reported disfavored treatment that was perceived to be highly or moderately unfair reported greater jealousy and in turn, more depressive symptoms. Similarly, there was a significant indirect effect of PDT on youth's risky behaviors through jealousy at low ($b = .22$, $SE = .10$, 95% $CI [.07, .48]$, $\beta = .05$) and average fairness ($b = .13$, $SE = .06$, 95% $CI [.04, .29]$, $\beta = .03$), but not high fairness ($b = .04$, $SE = .04$, 95% $CI [-.03, .15]$, $\beta = .01$). Also consistent with predictions, adolescents who reported disfavored treatment that was perceived to be highly or moderately unfair reported greater jealousy and more risk-taking behaviors. It should be noted, however, that the direct effect of PDT on risky behaviors ($b = .57$, $SE = .23$, $t = 2.47$, $p < .05$, $\beta = .13$) remained significant, indicating that the indirect pathway did not account for the entire association. Finally, there was a significant indirect effect of PDT on adolescents' self-worth through jealousy at low ($b = -.03$, $SE = .01$, 95% $CI [-.06, -.01]$, $\beta = -.07$) and average fairness ($b = -.02$, $SE = .01$, 95% $CI [-.03, -.00]$, $\beta = -.04$), but not high fairness ($b = -.00$, $SE = .01$, 95% $CI [-.02, .00]$, $\beta = -.01$). Again,

consistent with predictions, these results indicated that adolescents who perceived their disfavored treatment to be highly or moderately unfair reported greater jealousy and, in turn, lower self-worth.

In order to examine whether the indirect effects of PDT and adolescents' depressive symptoms, risk-taking behaviors, and self-worth were moderated by the gender constellation of the dyad, conditional process analyses were performed (Hayes, 2009; 2013). Similarly to the fairness models, a PDT X gender composition interaction was included as a predictor of sibling jealousy. This interaction, however, was not significant ($b = -.00$, $SE = .02$, $t = -.17$, ns , $\beta = -.02$), indicating that gender constellation of the dyad did not moderate the pathway from PDT to jealousy, and in turn, the indirect pathway to adolescent adjustment.

Discussion

Extant research indicates that perceived parental differential treatment (PDT) is associated with poor adjustment outcomes for adolescents (e.g., Feinberg, McHale, Crouter, & Cumsille, 2003; McHale, Updegraff, & Whiteman, 2012; Milevsky, Smoot, Leh, & Ruppe, 2005). Despite the identification of these direct links between PDT and youth maladjustment, the mechanisms underlying the associations remain unclear. The present study addressed this gap by examining whether sibling jealousy helped to explain the associations between PDT and youth's adjustment. Furthermore, we explored whether youth's perceptions of fairness and the gender constellation of the dyad moderated the relations between PDT and jealousy, and in turn the indirect pathway linking PDT to adjustment.

Importantly, these hypotheses were tested controlling for several factors that have been previously found to be associated with PDT as well as youth's adjustment. Specifically, we controlled for youth's age, age spacing of the sibling dyad, family size, youth's gender, and parents' socioeconomic status (McHale, Crouter, McGuire, & Updegraff, 1995; Scholte et al., 2007; Shanahan et al., 2008). Additionally, we controlled for multiple markers of parent-adolescent relationship quality (i.e., acceptance and conflict), to determine whether PDT dynamics accounted for variance in youth's adjustment beyond the established links between dyadic parent-child relationships and adolescents' internalizing symptoms and externalizing behaviors (Garber, Robinson, & Valentiner, 1997; Hair, Moore, Garrett, Ling, & Cleveland, 2008; Steinberg, Mounts, Lamborn, & Dornbusch, 1991).

Consistent with prior research, bivariate correlations revealed significant associations between PDT and youth's adjustment outcomes; specifically, disfavored treatment was positively linked to depressive symptoms and risky behaviors and negatively linked to feelings of self-worth. Furthermore, disfavored treatment was positively related to sibling jealousy, and sibling jealousy was related to all three adjustment outcomes. When incorporated into a comprehensive path model, there was a significant indirect effect of disfavored treatment to each adjustment outcome through jealousy, above and beyond the effects of dyadic parent-youth relationship characteristics. For depressive symptoms and self-worth, jealousy fully accounted this relation, suggesting that jealousy may be especially salient in domains that are related to affective or internalizing states. In fact, of the few

studies to investigate sibling jealousy, Salovey (1991) and Salovey and Rodin (1984) found strong associations between jealousy and poor adjustment outcomes, particularly in terms of diminished self-worth. For youth's risk-taking behaviors, however, the direct pathway from differential treatment remained significant, indicating that sibling jealousy only partially accounted for this relation. Although the affective state of jealousy may influence adolescents' risk-taking behaviors, additional mechanisms need to be explored to understand PDT's relation with adolescents' externalizing behaviors. One such mechanism may be sibling conflict. Previous studies have shown that sibling conflict is positively related to both PDT (Brody, Stoneman, & McCoy, 1992; McHale et al., 1995) and to externalizing problems in adolescents (Richmond, Stocker, & Rienks, 2005; Slomkowski, Rende, Conger, Simons, & Conger, 2001). Thus, disfavored treatment may lead to sibling conflict and a generalized style of antisocial behavior, including risky and delinquent behaviors (Patterson, 1984).

Although models revealed significant indirect effects from PDT to adolescents' adjustment through jealousy, youth's perceptions regarding the fairness of parents' treatment moderated these findings. Specifically, disfavored treatment was positively related to jealousy and, in turn, jealousy was positively related to risk-taking and depressive symptoms and negatively related to self-worth only when PDT was viewed as moderately (i.e., average) or highly (i.e., $-1\ SD$) unfair. Consistent with prior research, it is not only differential treatment that has implications for adolescents, but also youth's perceptions of whether or not this treatment is fair (Kowal & Kramer, 1997; Kowal et al., 2002). The present study advanced understanding of this family dynamic by also assessing the moderating effect of fairness on the pathway from PDT to jealousy. Findings indicated that perceptions of fairness actually dampened the association between PDT and jealousy, which in turn, ameliorated PDT's association with youth's adjustment outcomes.

Inconsistent with study hypotheses, gender constellation of the dyad did not moderate the association s linking PDT, jealousy and adjustment. Prior findings regarding the role of sibling dyad gender constellation on adolescent adjustment and PDT have been mixed; some studies indicate that the effects of PDT are more pronounced for same- versus mixed-gender dyads, both in terms of internalizing (McHale et al., 2000) and externalizing behaviors (Slomkowski et al., 2001), whereas others fail to identify any gender constellation effects (Kowal & Kramer, 1997; Kowal et al., 2002; McHale, Crouter, & Tucker, 1999). Most studies of PDT focus on warmth and conflict, but in this study we included a greater diversity of domains, including chore assignments and privileges, which may reflect youth's age and birth order, making gender less salient as the focus for social comparisons.

Limitations and Implications

In the face of its contributions, limitations of this study suggest directions for future research. First, although the sample was representative of the region from which it was collected and included an SES range, the sample was not diverse in terms of race/ethnicity. Future studies should examine more diverse samples, in an effort to illuminate the potential role of cultural values and practices in PDT processes. For example, cultural values that promote communal versus individualistic orientations have been shown to mitigate the

negative effects of PDT (McHale, et al., 2005), and a next step is to determine their implications for youth's feelings of jealousy or perceptions of fairness. Second, this study included data from only two siblings per family. Although family size was controlled in our analyses, clearly youth can compare their treatment relative to all siblings in their family, so future research should consider the role of additional siblings to obtain a better understanding of how differential treatment operates in the family system (Meunier et al., 2012): Given parent and family resources are finite, differential treatment may be more likely in larger families, and a lack of equality may lead to feelings of jealousy toward the favored child. Third, given the data were collected from always married families, the results do not generalize to families of different compositions, which should be a focus for future inquiry. On the one hand, single parents, for instance, may not possess the same amounts and kinds of resources, making it difficult to treat children equitably; on the other hand, children in these families may be better able to understand the reasons for their parent's PDT such that its negative implications are mitigated. Fourth, although the SIDE has been validated and widely used, the temporal sequencing of the treatment, fairness, and jealousy items as well as the framing of sibling jealousy items in this study were not ideal. For example, the correlation between youth's reports of fairness and jealousy may have been inflated by the fact that these two domains were always rated in sequence. Additionally, given that our question about jealousy included "jealous or annoyed" we were unable to disentangle whether the youth were focused on feelings of jealousy. Thus, future research should counterbalance these questions and use more straightforward measures of jealousy. Fifth, given statistical power considerations, this study only examined gender dynamics for same- versus mixed-gender sibling dyad constellations, as opposed to all four gender constellation possibilities. Thus, future research with larger samples would benefit from examining whether differential treatment and jealousy dynamics vary across other dyad combinations (e.g., older brother-younger sister, older brother-younger brother). Finally, this study was limited by its cross-sectional nature; as such, we were unable to discern directionality of effects. Although theory holds that parents' differential treatment may lead to greater jealousy and ultimately, poorer adjustment outcomes, it is also possible that adjustment differences between siblings elicit PDT and feelings of jealousy. It is also possible that these processes are bidirectional. In order to assess the directionality of effects, future studies should employ longer-term longitudinal designs.

Despite these limitations, this study provided initial evidence that adolescent siblings' feelings of jealousy help to explain the often documented association between PDT and youth's adjustment. Importantly, however, these indirect pathways were only significant when adolescents perceived parents' treatment as less fair. According to the mean levels of fairness reported by youth, those who reported somewhat fair treatment were more likely to experience negative outcomes. It was not unless youth reported treatment as being highly fair that this effect was ameliorated. This pattern of findings suggests that families would benefit from parents' communication with their adolescent children regarding their reasoning behind differential treatment (Kowal & Kramer, 1997). Understanding the reasons for their parents' behaviors may lead to a sense that their treatment is fair and reduce feelings of jealousy toward siblings, with positive implications for youth's adjustment. Furthermore, it is important that youth vocalize their concerns regarding perceived

differential treatment in order for parents to adequately address these concerns. Parent education programs rarely focus on such sibling-related dynamics, and a direction for research is to test the causal role of factors such as communications about the reasons for PDT in the context of experimental intervention studies.

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Figure 1.
Simple slopes for disfavored treatment—jealousy links at low, average, and high fairness.

Table 1

Adolescent Reports of PDT, Jealousy, Adjustment Outcomes, and Fairness: Correlations and Descriptive Statistics (N = 388)

	1	2	3	4	5	6
1. PDT	--					
2. Jealousy	.45***	--				
3. Depressive Symptoms	.12*	.21***	--			
4. Self-worth	-.11*	-.26***	-.47***	--		
5. Risky Behaviors	.29***	.27***	.21***	-.16**	--	
6. Fairness	-.46***	-.64***	-.19***	.18***	-.23***	--
<i>M</i>	2.86	1.46	21.46	3.15	25.53	2.37
<i>SD</i>	1.77	.45	5.64	.66	7.67	.40
<i>Range</i>	0 - 10	1 - 4	12 - 48	1 - 4	18 - 72	1 - 3

*
 $p < .05$.

**
 $p < .01$.

 $p < .001$.

Direct Effects of Controls, PDT, Fairness, and Jealousy on Adolescents' Depressive Symptoms, Self-Worth, and Risk-Taking Behaviors (N = 388)

Table 2

Predictors	Jealousy			Depressive Symptoms			Self-Worth			Risky Behavior		
	b	(SE)	β	b	(SE)	β	b	(SE)	β	b	(SE)	β
Age	.02	.02	.07	.35	.35	.06	-.03	.04	-.05	1.50***	.42	.20
Age Spacing	-.00	.02	-.01	-.33	.32	-.05	-.01	.03	-.02	-.51	.39	-.06
Family Size	.04	.03	.09	-.09	.36	-.01	.04	.04	.04	-.42	.44	.02
Gender	-.05	.03	-.11	-.79	.56	-.14	.15*	.07	.22	1.63*	.72	.21
SES	.00	.02	.00	-.72*	.35	-.13	.09*	.04	.13	-.47	.42	-.06
Parent Accept.	-.03	.05	-.03	-.59	.73	-.04	.09	.08	.06	-2.83***	.89	-.16
Parent Conflict	.00	.00	.03	.10*	.05	.12	-.01†	.00	-.10	.18**	.06	.16
Fairness	-.59***	.05	-.52	-.71	.98	-.05	-.02	.11	-.01	-1.58	1.18	-.08
PDT	.05***	.01	.19	.13	.19	.04	-.00	.02	-.00	.58*	.23	.13
Jealousy				2.06**	.73	.16	-.32***	.08	-.22	2.64**	.88	.15

* $p < .05$.

**

* $p < .01$.

* $p < .001$.