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Parent–Child Discrepancies in Perceived Parental Favoritism: Associations with Children's Internalizing and Externalizing Problems in Chinese Families

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Abstract

Previous studies have found discrepancies between parent and child reports of parental favoritism. Some studies have also found that these discrepancies have unique effects on children's psychosocial adjustment. Nonetheless, much is still unknown about discrepancies between parent-reports and child-reports of parental favoritism and how they are associated with children's development. The current study examines discrepancies in multi-informant reports on parental favoritism in relation to children's internalizing and externalizing problems. The sample consisted of 556 mother–child dyads and 554 father–child dyads (46% boys, $M_{age} = 12.52$ years, $SD_{age} = 1.18$). Polynomial regression analyses and response surface analyses were used to disentangle the effects of parent–child discrepancies in perceived parental favoritism. The results indicate that children reported higher parental favoritism than their parents. And the highest internalizing and externalizing problems occurred when both the mother and the child reported high maternal favoritism, and when both the father and the child report high paternal favoritism. Therefore, these findings partly support the assumptions based on the operations triad model. The findings also highlight the importance of the discrepancy between child- and parent-reports on parental favoritism in the development of children's internalizing and externalizing problems.

Keyword Parental favoritism · Discrepancies · Parent-reports · Child-reports · Internalizing problems · Externalizing problems

Introduction

Parental favoritism is a common phenomenon in which parents treat, or are perceived to treat one or some of their children more positively than their other children (Brody et al. 1998). Many studies have revealed that perceptions of parental favoritism can be related to children's negative outcomes (Rolan and Marceau 2018). For example, Feinberg and Hetherington (2001) has found that parental favoritism is positively associated with aggression. At the same time, previous studies have also shown that both

parents and children can perceive parental favoritism (Brody and Stoneman 1990), which means that parental favoritism can be assessed using both child-reports and parent-reports. However, in many of these studies, children's reports of parental favoritism did not match their parents' reports (e.g., Coldwell et al. 2008). Such discrepant reports may make it difficult to accurately assess parental favoritism and may lead to inconsistencies in research findings. Various theories have been proposed regarding the meaning behind discrepant reports (Ferdinand et al. 2004), which indicate that parent–child discrepancies in and of themselves may be of interest (Guion et al. 2008). Moreover, some researchers (e.g., Gaylord et al. 2003) have found that the discrepancies between parent and child reports of parenting have unique relations to children's psychosocial adjustment. Thus, the present study tended to examine the meaning behind discrepancies between child- and parent-reports of parental favoritism.

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Theoretical Perspective on Informant Discrepancies

In both clinical practice and research on family functioning and child adjustment, the multiple-informant approaches have become highly desirable (Nelemans et al. 2016). Previous studies have demonstrated that multiple viewpoints, specifically those of the child and the parent, were not mutually exclusive and can provide valid information (De Los Reyes and Kazdin 2004, 2005). However, these multiple viewpoints often bring with them disagreements among informant's reports on the same construct, which were known as informant discrepancies. For example, on the base of mate-analysis, researchers found that correspondence level between adolescents' and parents' reports of family functioning routinely hovers in the low-to-moderate range (De Los Reyes et al. 2015). And what do these informant discrepancies mean? Historically, these discrepancies often were perceived as "measurement error" that obscured the objective reality of children's and adolescents' experience (Bell et al. 2001). However, recent theoretical research indicates that discrepancies can provide incrementally valuable information about and even beyond the constructs for which the informants provide reports (De Los Reyes 2011). For example, parent–child discrepancies for parenting skills may reflect disrupted communication patterns (Feinberg et al. 2000) that have deleterious effect for child adjustment.

In order to promote the understanding of informant discrepancies between parents and children of family functioning domains (e.g., parenting practice), De Los Reyes and Ohannessian (2016) designed the operations triad model, which reveals how convergence and divergence between parents' and children's reports may influence child development. According to this model, when children and their parents converge in reports of relatively low levels of risk factors (e.g., parental favoritism), this convergence tend to have no impact on child development. On the contrary, convergence of high levels of risk factors between parent and child informants may be a marker for high severity or level of that risk factor. That is, it is more likely the case that this risk factor either has present for a long time, or consistently manifests between parent–child interaction. Moreover, according to this model, the effect of the parent–child divergence may be different in different situations. Divergence between parents' and children's reports is linked to more positive child development when it reflects adaptive family process (i.e., realignment of family relationships; Longmore et al. 2013), because this divergence may play a functional role in children autonomy development. In contrast, when divergence between parents' and children's reports of family functioning reflects family maladaptive process (i.e., family disorganization and miscommunication; Lippold et al. 2013), children may

display more negative developmental outcomes. In this case, the mechanism underlying the divergence between parent's and child's report may be that parent has a lack of knowledge of key aspects of child's life (Goodman et al. 2010), which, in turn, hinders parent's ability to protect the child from the risk factor. Furthermore, in such situation, the higher the parent–child divergence means less parent know about their child's life. In other words, the more divergence between parent and child reports there is, the more negative developmental outcomes child displays. Although this model does not discuss how the direction of divergence is associated with the child development, some family system theorists have proposed that the divergence of either direction (i.e., parents score higher than children, or children score higher than parents) would be related to more negative outcomes if the divergence reflects family maladaptive process (Minuchin1985).

Methodological Considerations Associated with Informant Discrepancies

In prior research, exploring the effects of parent–child discrepancy on outcomes such as child developmental outcomes has largely involved operationalizing discrepancies between two informants as difference scores (e.g., Godshalk and Sosik 2000). However, researchers have criticized that the use of difference scores as test of hypotheses involving informant discrepancies has many limitations. For example, combining two distinct measures into one artificial score leads to a loss of valuable information, such as the extent to which each of the component measures contributes to the variance in the outcome (Shanock et al. 2010). As a result, using difference scores to study the informant discrepancies may meet the problems with ambiguous interpretation and confounded effects (De Los Reyes et al. 2013; Hom et al. 1999)

As a superior alternative to the analysis of informant discrepancies—one that overcomes the shortcoming of different scores—Edwards (2002) has advocated the use of polynomial regression and response surface methodology. These methodologies adopt a three-dimensional approach by keeping distinct component measures (child and parent reports) as separate two predictors, thus the independent effect of each component measures are retained, which makes it possible to examine the extent to which each component measures contributes to the outcome variable (Shanock et al. 2010). Moreover, the polynomial regression and response methodology would retain information regarding the strength and direction of convergence and divergence, thus allowing for more nuanced interpretation of the effects of two predictors on outcomes (Shanock et al. 2010). Of current interest, polynomial regression analyses can afford a precise test of whether and how convergence

and divergence between parent and child reports of parental favoritism were related to child development outcomes. In addition, this methodology also can afford consideration of the extent to which the direction and magnitude of convergence and divergence are relevant child development.

Predictive Utility of Informant Discrepancies Regarding Parental Favoritism

Under the influence of Confucian beliefs, which emphasize the importance of communality and, hierarchical structures both within families and within society (Shek 2002), parental favoritism is more prevalent in Chinese families than in Western families (Barrett Singer and Weinstein 2000). And previous studies have revealed that pronounced level of parental favoritism is pathogenic (Suitor et al. 2008). Moreover, studies consistently show that parental favoritism is a deleterious phenomenon for both the favored child and the disfavored child (Jeannin and Van Leeuwen 2015). Hence, parental favoritism serves as a negative family attribute that can do harm to children development. In addition, a survey of literature examining parental favoritism reveals a focus mainly on one-informant reports (e.g., only focus on children's reports; Meunier et al. 2012), with less emphasis on multiple-informant (that is, child and parent) reports. And the only study the authors are aware of that adopted multiple-informant approach was by Coldwell et al. (2008). In their study, both children and mothers were interviewed about the parental favoritism, but in the process of analyses, the child-reports and parent-reports were used separately. Thus, the parent–child discrepancies in parental favoritism and the effect of these discrepancies still remains unknown.

In addition, although many studies have repeatedly highlighted that parental favoritism is a potential risk factors for children's internalizing and externalizing problems (e.g., Meunier et al. 2012; Richmond et al. 2005), little is known about the relationship between parent–child discrepancies in parental favoritism and children's internalizing and externalizing problems. Studies have indicated that internalizing and externalizing problems that persist through adulthood are often rooted in childhood (Ashford et al. 2008; Mazza et al. 2009). For example, internalizing problems in childhood have been linked to pervasive and adverse developmental outcomes, such as depression and anxiety disorders, academic underachievement, and problems with employment (Aronen and Soininen 2000; Woodward and Fergusson 2001), externalizing problems in childhood increase the risk for aggression and substance use later in life (Maggs et al. 2008). Thus, the relationship between parent–child discrepancies in parental favoritism and children's internalizing and externalizing problems was explored in the present study.

Based on the operations triad model (De Los Reyesand and Ohannessian 2016)—which poses that parent–child convergence of high levels of perceived risk factors indicates that the high severity of this factor—it is expected that parent–child convergence of higher level of parental favoritism may be risky for children's internalizing and externalizing problems. On the contrary, the convergence between parent and child of low levels of parental favoritism may have no impact on children's internalizing and externalizing problems under this model. Furthermore, parent–child divergence of parental favoritism may be due to the different perceptions about the legitimacy of parental favoritism. For instance, some parents may perceive that their parenting differences are in line with siblings' different needs (Kowal et al. 2006). However, children are most likely to perceive that such different treatment represents a benefit that they do not fairly earn (Kowal et al. 2002). According to this model, parent–child divergence of perceived parental favoritism may reflect parent's lack of awareness of child's life (De Los Reyes et al. 2010), which has negative impacts on internalizing and externalizing problems. In such situation, the higher the parent–child divergence means the more divergence between parent and child reports there is, the more developmental outcomes child displays. Moreover, the divergence of either direction (i.e., parents report more parental favoritism than children, or children report more parental favoritism than parents) is related to more internalizing and externalizing problems. Hence, it is insightful to examine how parent–child convergence and divergence of perceived parental favoritism in Chinese families is associated with children's internalizing and externalizing problems.

According to the social role theory (Eagly et al. 2000), fathers play a more prominent role in feeding families, while mothers are mainly responsible for child caregiving and household management. This responsibility divide is more salient in Chinese culture, as reflected by the Chinese saying of *nan zhu wai, nv zhu nei* ("men work outside the family; women work inside the family"; Leung and Shek 2012). This perspective has highlighted the important role of women's greater investment in parenting, relative to those of fathers in Chinese culture (Lewis and Lamb 2003). Such higher investments have been found to result in closer ties between mothers and children (Suitor et al. 2011). Thus, there may be marked differences in the effects of fathers' and mothers' favoritism on children development (McKinney and Renk 2008). At the same time, little is known about how discrepancies in maternal favoritism and paternal favoritism may, or may not, be differentially associated with children's externalizing and internalizing problems. As such, there is a need to involve fathers as respondents in the investigation of whether father–child convergence and

divergence of perceived paternal favoritism are associated with children's externalizing and internalizing problems.

Current Study

This study sought to investigate how the convergence and divergence of perceived parental favoritism between children and parents are associated with children's internalizing and externalizing problems in Chinese families. In addition, in line with the social role theory, discrepancies in maternal and paternal favoritism in association with children's externalizing and internalizing problems were distinguished.

It was expected that the parent–child discrepancies in parental favoritism are related to children reporting more internalizing and externalizing problems. Moreover, based on the operations triad model (De Los Reyesand and Ohannessian 2016), it was hypothesized that parent–child convergence of high levels of parental favoritism would be related to an increase in internalizing and externalizing problems. Furthermore, it was also expected that parent–child divergent of parental favoritism was in association with children's internalizing and externalizing problems. Specifically, the present study hypothesized that larger divergence between children's and parents' perceptions of parental favoritism would be associated with more severe internalizing and externalizing problems. In addition, according to previous studies (Gaylord et al. 2003), the divergence of either direction (i.e., parents report more parental favoritism than children, or children report more parental favoritism than parents) would be related to more internalizing and externalizing problems.

Methods

Participants and Procedure

This study is part of Child Family Relationship Study (CFRS), a study based on a sample from Henan Province, investigating the relationship between family relationship (e.g., sibling relationship) and child development. Data for this study were collected among students in the fifth and sixth grades of six primary schools and in the seventh and eighth grades of six secondary schools in three cities of Henan Province. Before the start of the study in June 2018, children and their parents received a complete description of the study and provided active written informed consent to participate. On the day of data collection, children from randomly selected schools were invited to complete measures of perceived paternal and maternal favoritism, internalizing problems, and externalizing problems in their classroom, supervised by trained volunteers. Fathers and mothers were invited to complete a measure of paternal and maternal favoritism, respectively, which children brought home from schools. Each participant completed the measures independently in a self-administered format to safeguard confidentiality.

There were 1585 children that participated the CFRS. Because the present study mainly focused on the child–parent discrepancies in parental favoritism, 857 children that form non-two-child families were excluded. Thus, there were 728 children that from two-child families participated. Because the present study was interested in mother–child dyad and father–child dyads, 127 children without a participating parent were excluded. Additionally, 34 cases were dropped from the study, because no child reports on parent favoritism were available. The final analytic sample consisted of 543 children (95.76%) for whom both parents participated, 13 children (2.29%) for whom only the mother participated, and 11 children (1.95%) for whom only the father participated. Thus, there were 556 mother–child dyads and 554 father–child dyads in the subsequent analyses. And the independent t tests were conducted to examined whether there were any differences between children in the final analytic sample and children who were dropped. The results indicated that children in the final analytic sample did not differ from children who were dropped in their family SES (composed by parental education levels, parental occupation and parental income) ($t_{(1581)} = 2.486$, $p = 0.785$), self-reported externalizing problems ($t_{(1581)} = -0.171$, $p = 0.864$) and externalizing problems ($t_{(1581)} = -1.571$, $p = 0.117$).

The mean ages of mothers and fathers were 39.52 years ($SD = 8.29$) and 40.56 years ($SD = 7.83$), respectively. A high proportion of parents had a low educational level, with 303 (54.50%) mothers and 272 (49.10%) fathers possessing a junior secondary education or lower. A total of 178 (32.01%) mothers were housewives, and 481 fathers (86.82%) were working fathers. Regarding the children, 261 (46.03%) boys and 306 (53.97%) girls participated in the study. The mean age of children was 12.52 years ($SD = 1.18$), with the mean age of boys and girls being 12.56 years ($SD = 1.12$) and 12.55 years ($SD = 1.19$), respectively. There were 297 (52.38%) children in primary school (grade 5 to grade 6), and 270 (47.62%) children in secondary school (grade 7 to grade 8). All children reported that they had only one sibling and all of them were living in intact two-parent families.

For mother–child dyads, 94.96% had complete data, 0.72% had one item missing, and 4.32% had a missing on more than one item. For father–child dyads, 93.51% had complete data, 1.62% had one item missing, and 4.87% had a missing on more than one item. Little's MCAR Test (Little and Rubin 2002), using expectation maximization

estimation, revealed that the χ^2 of mother–child dyads and father–child dyads were 62.20 ($p = 0.58$) and 82.81 ($p = 0.39$), respectively, which indicated that the data was missing not at random. Therefore, multiple imputation—which represents a state-of-the-art technique for replacing missing values (Allison 2002)—was used to impute missing data (Rubin 2003) in SPSS before analyzing the data.

Measures

Parental Favoritism

The Favoring Subject of Egna Minnen Betraffande Uppfostran (EMBU; Perris et al. 1980) is a self-report questionnaire which accesses the degree that the child himself (herself) is favored. In the present study, the Chinese version of the Favoring Subject (Wang et al. 1999), which included 5 items for paternal and maternal favoritism, respectively, was used to assess maternal and paternal favoritism. Respondents are requested to rate each statement on 4-point Likert scale ranging from 1 = *never* to 4 = *always*. An example of the items is "Do your parents spoil you more than they do your brothers and sisters?" for paternal and maternal favoritism, respectively. The maternal (5 items) and paternal version (5 items) were modeled after the child's version. The mean score of all items was used, and higher scores imply greater perceptions of paternal (maternal) favoritism. In this study, internal consistency for the Favoring Subject was found to be good across informants. Specifically, Cronbach's alpha was 0.81 for child-reports on maternal favoritism, 0.82 for child-reports on paternal favoritism, 0.66 for mother-reports on maternal favoritism, and 0.70 for father-reports on paternal favoritism.

Internalizing Problems

The Aggression Questionnaire has been widely used to assess self-report aggression behaviors (Bush and Perry 1992). Two subscale, the Anger subscale (AN) and the Hostility subscale (HO) were adopted in this study. The Anger subscale (AN) comprised 7 items assessing anger. A sample item is "I flare up quickly but get over it quickly." The Hostility subscale (HO) included 8 items assessing hostility. A sample item is "At times I feel I have gotten a raw deal out of life." After reverse-coded items were recoded, the mean scores on 15 items were used, based on a 5-point Likert scale (1 = almost never true to 5 = almost always true). Higher scores indicate higher internalizing problems. Both the AN and HO showed good reliability in this study (AN: $\alpha = 0.75$; HO: $\alpha = 0.74$).

Externalizing Problems

The 9-item Physical Aggression subscale of the Aggression Questionnaire (Bush and Perry 1992) was used to assess children's externalizing problems. Example items are "Given enough provocation, I may hit another person." and "I get into fights a little more than the average person". The items were answered on a 5-point Likert scale ranging from 1 = almost never true to 5 = almost always true. After reverse-coded items were recoded, facet scores were each based on the mean of 9 items. And higher scores mean more externalizing problems. Cronbach's alpha was good, $\alpha = 0.77$.

Analytic Strategy

Polynomial regression analysis was used to examine whether convergence and divergence in children's and parents' reports on parental favoritism were related to children's internalizing and externalizing problems. To perform a polynomial regression analysis, the children's and parents' reports on parental favoritism were centered around their mean scores. In the polynomial regression model, the following are estimated: an intercept (b_0), a linear (b_1) effect, and quadratic (b_3) effect of the child report (X), a linear (b_2) effect, and quadratic (b_5) effect of the maternal/paternal report (Y), and an effect of the interaction between the child report and maternal/paternal report (b_4). Therefore, the resulting equation is $Z = b_0 + b_1X + b_2Y + b_3X^2 + b_4XY + b_5Y^2 + e$. Due to the combination of quadratic terms and an interaction term, interpretations of polynomial regressions are notoriously difficult. To facilitate interpretation, response surface analyses have been developed (see Box and Draper 1987; Edwards and Parry 1993).

Response surface analyses provide a visual representation of the outcomes of polynomial regressions, based on congruence and incongruence between the child report and parent report (either mother or father). Two parameters (a_1 and a_2) assess effects among a Line of Congruence. These effects assess how internalizing and externalizing problems are associated with parental favoritism when parent and children have similar scores. They indicate a linear slope ($a_1 = b_1 + b_2$) and quadratic slope ($a_2 = b_3 + b_4 + b_5$) of congruence of children's and parents' reports on internalizing and externalizing problems. Thus, significant effects indicate that the congruence of children's and parents' reports is associated with internalizing and externalizing problems.

Other linear (a_3) and quadratic (a_4) terms indicate whether there is an incongruence effect of children's and parents' reports on internalizing and externalizing problems, along a line of incongruence. The linear slope effect ($a_3 = b_1 - b_2$) indicates the likelihood for higher internalizing and

externalizing problems when the child scores higher than the parent on parental favoritism. The quadratic effect ($a_4 = b_3 - b_4 + b_5$) indicates whether internalizing and externalizing problems are especially likely at high or low levels of incongruence. Thus, the significant effects indicate that incongruence in children's and parents' reports impacts internalizing and externalizing problems.

However, some researchers have argued that polynomial regressions may cause overfitting of the data (Schönbrodt 2016b). Therefore, Schönbrodt (2016b) proposed five simpler fitting models. For these fit models, all of them are nested under the full polynomial model and have fewer degrees of freedom. Two of these fit models are usually used in the situation in which the predictor variables are not measured on a similar scale or that the variables are theoretically expected to have a dissimilar effect on the outcome variable (Franken et al. 2017). Because that is not the case in the study, these two models were not used. The other three fit models, which were compared with the full polynomial regression model, were utilized in the study.

The first types of models assume that there is no main effect of children's or parents' report on the outcome variable, but allow for (in)congruence effects. Thus, the level of parental favoritism does not affect internalizing and externalizing problems, but it does matter how parents and children (dis)agree with the level of parental favoritism. The sub-model *shifted squared difference model (SSQD)* models an effect of (in)congruence, but optimal levels of (in)congruence do not have to be at numerical equality. Thus, this model takes into account that the optimal match might not be when both parent and child have exactly the same score but rather allows the optimal match not to have numerical equality (for example if the optimal match is when child scores higher than parents).

The second types of fit models also assume (in)congruence, but they also take the impact of the level of parent and child reports on internalizing and externalizing problems into account. Thus, these models also indicate how congruent levels of children's and parents' reports on favoritism are associated with internalizing and externalizing problems. The sub model basic *rising ridge model (RR)*

assumes that there is a main effect of (in)congruence but also an effect of parental favoritism at congruent levels of parent and child reports when internalizing and externalizing problems are predicted. Again, the shifted version of the *shifted rising ridge model (SRR)* takes into account that the optimal match might not be when both parents and children have the exact same score.

These effects were estimated using the RSA package in R (Schönbrodt 2016a). For model selection, guidelines from Schönbrodt (2016b) were used. The main determinant for model selection was the corrected Akaike Information Criterion (AICc). Generally, the model with the smallest AICc is considered the best model. The absolute size of AICc cannot be interpreted, as it depends on arbitrary constants in the calculation. The relevant measure is the difference in AICc, or the ΔAICc, between any two models. A ΔAICc higher than two indicates significantly worse model fits. As AICc indices only indicate whether certain models are better than other models, rather than provide evidence of the absolute plausibility of models, R^2_{adj} should be used to assess the explained variance. If the explained variance (R^2_{adj}) is significant, the results can be interpreted. All variables were centered to facilitate interpretation. A score of zero thus means that participants had an average score, within their role (i.e., father, mother, or child). Positive scores indicate higher-than-average scores on parental favoritism while negative scores indicate lower-than-average.

Results

Descriptive Statistics

An overview of the means and standard deviations of all study variables as well as congruency between parent and child reports of parental favoritism that by paired *t* tests for mean level and by bivariate correlations was shown in Table 1. Children reported higher maternal favoritism than did mothers, and they also reported higher paternal favoritism than did fathers. In addition, child and parent reports of parental favoritism were positively and significantly

Table 1 Congruence between parent and child reports

Variable	Parent report	Child report	Difference in means			Association between parent and child reports	
	M(SD)	M(SD)	df	t	p	r	p
Child–mother PF	1.27 (0.42)	1.54 (0.54)	555	11.304	0.000	0.143	0.01
Child–father PF	1.28 (0.44)	1.57 (0.59)	553	11.298	0.000	0.181	0.01
Internalizing problems		2.57 (0.68)					
Externalizing problems		2.50 (0.58)					

PF parental favoritism

Table 2 Correlations among internalizing and externalizing problems and child reports, parent reports

Variables	1	2	3	4	5	6
1 Child-reported maternal favoritism	–	–	–	–	–	–
2 Child-reported paternal favoritism	0.732**	–	–	–	–	–
3 Mother-reported maternal favoritism	0.143**	0.108**	–	–	–	–
4 Paternal-reported paternal favoritism	0.177**	0.181**	0.651**	–	–	–
5 Internalizing problems	0.245**	0.239**	0.156**	0.159**	–	–
6 Externalizing problems	0.188**	0.144**	0.133**	0.072	0.690**	–

$*p < 0.05$, $**p < 0.01$, $***p < 0.001$

Table 3 Outcomes of the fit-analyses of parent–child discrepancies in parental-favoritism predicting internalizing and externalizing problems

	Best model	R^2_{adj}
Internalizing problems (See Table 4 for more details)		
Mother–child dyad	Rising Ridge model	0.068***
Father–child dyad	Rising Ridge model	0.076***
Externalizing problems (See Table 5 for more details)		
Mother–child dyad	Rising Ridge model	0.056***
Father–child dyad	Additive model	0.027***

$*p < 0.05$, $**p < 0.01$, $***p < 0.001$

associated for both mothers and fathers, $r = 0.143$ ($p < 0.05$) and 0.181 ($p < 0.05$), respectively.

Correlations among the measuring variables are shown in Table 2. Correlational analyses indicated that father-reported and child-reported paternal favoritism estimates were correlated ($r = 0.181$, $p < 0.01$). Additionally, mother-reported maternal favoritism was also associated with child-reported maternal favoritism ($r = 0.143$, $p < 0.01$). Except for father-reported paternal favoritism, which was only significantly correlated with children's internalizing problems, all other scores of paternal and maternal favoritism were positively related to children's internalizing and externalizing problems (Table 2).

Parent–child Discrepancies

Table 3 indicates that children's internalizing and externalizing problems were explained by discrepancies between children's and parents' reports on parental favoritism, as indicated by significant adjusted R^2. The effect size ranges from 0.027 for the model including the effect of father–child discrepancies on externalizing problems to 0.076 for the model including the effect of mother–child discrepancies on internalizing problems.

Parent–child Discrepancies and Internalizing Problems

For internalizing problems, the effects of the mother–child and the father–child discrepancy hypothesis were best

modeled (see Table 4) by Rising Ridge model (mother–child: $a_1 = 0.53$, $SE = 0.09$, $p < 0.001$; $a_2 = -0.00$, $SE = NA$, $p = NA$ (n.s.); $a_3 = -0.00$, $SE = 0.00$, $p = NA$ (n.s.); $a_4 = -0.14$, $SE = 0.16$, $p = 0.40$ (n.s.); father–child: $a_1 = 0.55$, $SE = 0.09$, $p < 0.001$; $a_2 = -0.00$, $SE = NA$, $p = NA$ (n.s.); $a_3 = -0.00$, $SE = 0.00$, $p = NA$ (n.s.); $a_4 = -0.29$, $SE = 0.14$, $p < 0.05$) This Rising Ridge model indicates that more congruence is associated with more internalizing problems, regardless of the level of parental favoritism at which parents and child agreed. For the mother–child dyad, Fig. 1 shows these outcomes. The x-axis indicates the level of child reported maternal favoritism, the y-axis indicates the level of mother reported maternal favoritism, and the z-axis indicates the level of children's internalizing problems. The significant a_1 effect with a nonsignificant a_2 effect indicates effects along the line of perfect agreement; there was a linear prediction from congruence about maternal favoritism on internalizing problems. This finding means that an increase in parental favoritism, when mother and child were in agreement about the level of maternal favoritism, of both mother and child is associated with an increase in internalizing problems. Along the line of incongruence, the a_3 and a_4 effects were nonsignificant; the direction and the degree of incongruence did not impact internalizing problems. For father–child dyad, the significant positive a_1 effect and nonsignificant a_2 effect suggest that there was significant liner effect of paternal favoritism on internalizing problems along the line of perfect agreement. An increase in paternal favoritism, when both father and child have similar scores, is associated with more internalizing problems. Along the line of incongruence, the a_3 effect was nonsignificant. Therefore, the direction of incongruence did not impact internalizing problems. However, the a_4 effect was significant and negative, which means that more congruence of father and child reported paternal favoritism is associated with more internalizing problems (see Fig. 2).

Parent–child Discrepancies and Externalizing Problems

For externalizing problems, effect of mother–child discrepancy was best modeled (see Table 5) by a Rising Ridge
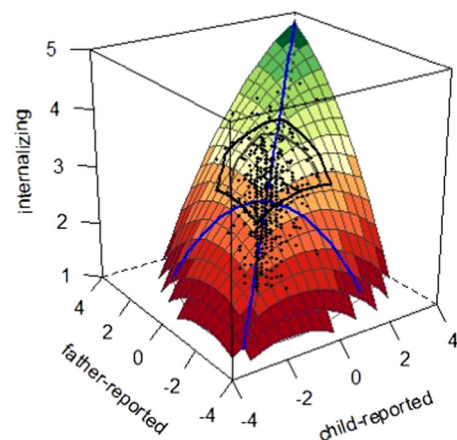
Table 4 Model comparison for the prediction of internalizing problems by mother, father and child reported parental favoritism. Ordered by delta AICc

Model name	K	AICc	ΔAICc	Evidence ratio	CFI	p_{model}	R^2_{adj}
Mother–Child Dyad							
RR	4	1170.292	0.000		1.000	0.000	0.068
Additive effects	4	1170.361	0.069	1.035	1.000	0.000	0.068
SRSQD	5	1171.159	0.867	1.543	1.000	0.000	0.068
SRR	5	1171.775	1.483	2.099	1.000	0.000	0.067
SRRR	6	1172.414	2.122	2.889	1.000	0.000	0.068
Full polynomial	7	1173.913	3.621	6.112	1.000	0.000	0.067
	Estimate	SE	p value				
b_0-intercept	2.587	0.032	0.000				
b_1-child report	0.266	0.045	0.000				
b_2-parent report	0.266	0.045	0.000				
b_3-child report squared	−0.034	0.041	0.401				
b_4-child × parent report	0.069	0.082	0.401				
b_5-parent report squared	−0.034	0.041	0.401				
Father–Child Dyad							
RR	4	1143.673	0.000		0.965	0.000	0.076
SRRR	6	1143.723	0.050	1.025	1.000	0.000	0.079
SRR	5	1144.572	0.899	1.568	0.967	0.000	0.076
Full polynomial	7	1145.105	1.433	2.047	1.000	0.000	0.079
Additive effects	4	1146.65	2.982	4.441	0.901	0.000	0.071
SRSQD	5	1147.329	3.656	6.222	0.909	0.000	0.072
	Estimate	SE	p value				
b_0-intercept	2.600	0.032	0.000				
b_1-child report	0.277	0.045	0.000				
b_2-parent report	0.277	0.453	0.000				
b_3-child report squared	−0.073	.035	.036				
b_4-child × parent report	0.146	0.070	0.036				
b_5-parent report squared	−0.073	0.035	0.036				

K Number of parameters, *AICc* corrected Akaike Information Criterion, *CFI* Comparative fit index, *Evidence ratio* Ratio of model weights of the best model compared to each other model, *pmodel* p value for explained variance of the model, R^2_{adj} adjusted R^2, *SRRR* Shifted and rotated rising ridge model, *SRR* Shifted rising ridge model, *RR* Rising ridge model, *SRSQD* Shifted and rotated squared difference model, *Additive effects* Model with two linear main effects
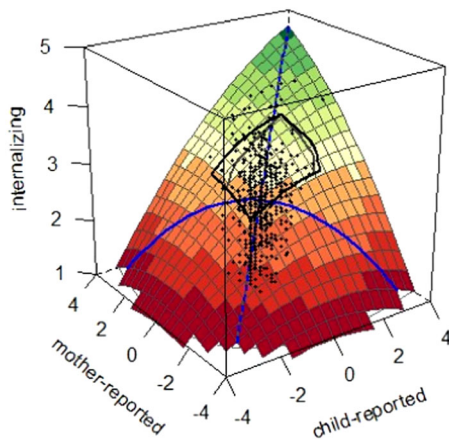
Fig. 1 Rising Ridge model: Mother–child discrepancy on maternal favoritism and its relation to children's internalizing problems

Fig. 2 Rising Ridge model: Father–child discrepancy on paternal favoritism and its relation to children's internalizing problems

Table 5 Model comparison for the prediction of externalizing problems by mother, father and child reported parental favoritism

Model name	K	AICc	ΔAICc	Evidence ratio	CFI	p_{model}	R^2_{adj}
Mother–Child Dyad							
RR	4	1232.203	0.000		1.000	0.000	0.056
Additive effects	4	1233.196	0.099	1.642	1.000	0.000	0.054
SRR	5	1234.044	1.840	2.510	1.000	0.000	0.054
SRSQD	5	1234.537	2.333	3.211	1.000	0.000	0.054
SRRR	6	1235.952	3.749	6.517	1.000	0.000	0.053
Full polynomial	7	1237.269	5.065	1.259	1.000	0.000	0.053
	Estimate	SE	p value				
b_0-intercept	2.238	0.033	0.000				
b_1-child report	0.211	0.047	0.000				
b_2-parent report	0.211	0.047	0.000				
b_3-child report squared	0.045	0.049	0.351				
b_4-child $\times$ parent report	-0.091	0.097	0.351				
b_5-parent report squared	0.045	0.049	0.351				
Father–Child Dyad							
Additive effects	4	1216.600	0.000		1.000	0.000	0.027
SRSQD	5	1216.913	0.312	1.169	1.000	0.000	0.028
RR	4	1216.985	0.384	1.212	1.000	0.000	0.026
Only child report	3	1217.518	0.917	1.582	0.949	0.000	0.023
Only child report squared	4	1217.974	1.373	1.987	0.988	0.000	0.024
SRR	5	1218.581	1.981	2.693	1.000	0.000	0.025
	Estimate	SE	p value				
b_0-intercept	2.242	0.029	0.001				
b_1-child report	0.175	0.055	0.058				
b_2-parent report	0.116	0.061	–				
b_3-child report squared	–	–	–				
b_4-child $\times$ parent report	–	–	–				
b_5-parent report squared	–	–	–				

Ordered by delta AICc

K Number of parameters, *AICc* corrected Akaike Information Criterion, *CFI* Comparative fit index, *Evidence ratio* Ratio of model weights of the best model compared to each other model, *pmodel* p value for explained variance of the model, R^2_{adj} adjusted R^2, *SRRR* Shifted and rotated rising ridge model, *SRR* Shifted rising ridge model, *RR* Rising ridge model, *SRSQD* Shifted and rotated squared difference model, *Additive effects* Model with two linear main effects

model ($a_1 = 0.53$, $SE = 0.09$, $p < 0.001$; $a_2 = -0.00$, $SE =$ NA, $p =$ NA (*n.s.*); $a_3 = -0.00$, $SE = 0.00$, $p =$ NA (*n.s.*); $a_4 = 0.18$, $SE = 0.19$, $p = 0.35$(*n.s.*)). Figure 3 shows that the significant positive a_1 and nonsignificant a_2 indicate that there is a positive linear effect along the line of congruence on children's externalizing problems. An increase in maternal favoritism, while child and mother reported similar level of favoritism, was associated with an increase in externalizing problems. However, along the line of incongruence, both the a_3 effect and a_4 effect were nonsignificant, which means that the direction and the degree of incongruence of maternal favoritism was not associated with the children's externalizing problems. For father–child dyads, the result of fit-analyses suggest that the best model was additive effects ($a_1 = 0.29$, $SE = 0.08$, $p < 0.001$; $a_2 = 0.00$,
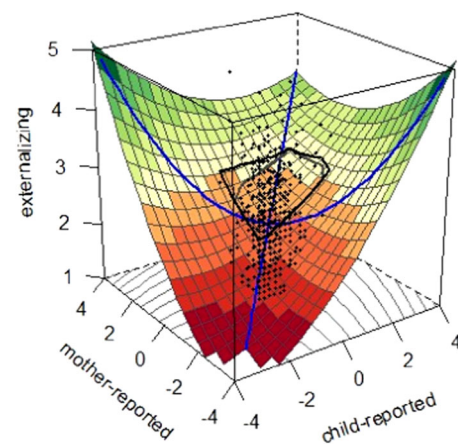
Fig. 3 Rising Ridge model: Mother–child discrepancy on maternal favoritism and its relation to children's externalizing problems
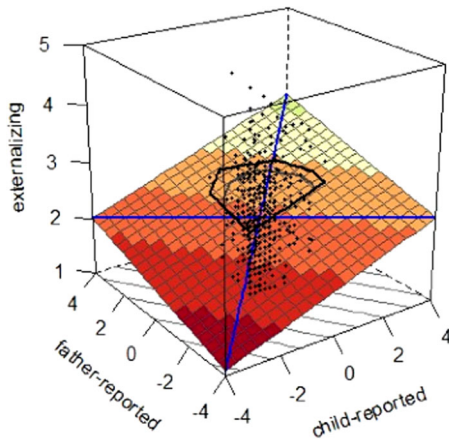
Fig. 4 Additive effects: Father–child discrepancy on paternal favoritism and its relation to children's externalizing problems

$SE = 0.00$, $p = NA$ (n.s.); $a_3 = 0.06$, $SE = 0.09$, $p = NA$ (n.s.); $a_4 = 0.00$, $SE = 0.00$, $p = NA$ (n.s.)). Additive effects indicate that there is only a significant linear effect of child reported paternal favoritism on externalizing problems, as well as that reported by fathers. Thus, as the significant positive a_1 effect indicates that an increase in paternal favoritism, while father and child have similar paternal favoritism scores, of father and child is associated with more externalizing problems (see Fig. 4).

Discussion

Parental favoritism, whether intentional or not, has been linked to child negative development outcomes (i.e., parental favoritism is linked to reports of increased internalizing problem and risk-taking/delinquency across time; Shanahan, McHale et al. 2008). Yet, children and parents often perceive parental favoritism differently, and according to the operations triad model (De Los Reyesand and Ohannessian 2016), differences in perceptions of the parental favoritism may constitute a risk for children's internalizing and externalizing problems. Therefore, the present study aimed to examine how parent–child discrepancies in perceptions of parental favoritism were associated with children's internalizing and externalizing problems.

Based on recent analytical suggestions, polynomial regression analyses and response surface plots, which have been proposed to represent more valid tests of hypotheses involving informant discrepancies than difference scores, were used (Laird and De Los Reyes 2013; Laird and Weems 2011). In summary, the current findings indicate that discrepancies between children and parents in perceived parental favoritism were related to children's externalizing and internalizing problems in Chinese families. When children perceived high levels of parental favoritism, children

expressed the highest level of internalizing and externalizing problems when parents also perceived high levels of parental favoritism.

The results of polynomial regression analyses and response surface analyses showed some support for the operations triad model in its interpretation of the convergent and divergent perceptions of parental favoritism. These findings echoed the operations triad model by showing that parent–child convergence of high levels of parental favoritism harmed child development in Chinese families. When both children and parents perceived high levels of parental favoritism, the internalizing and externalizing problems of the children were at their highest levels. It is obvious that high levels of parental favoritism perceived by both parents and children imply the possibility that high or severe levels of parental favoritism have been present for a long time.

Interestingly, in contrast to the hypothesis, although there is high degree of discrepancies between parent and child reports, the current study did not provide evidence that a discrepant view between child and parent of parental favoritism was related to internalizing and externalizing problems. The operations triad model has suggested that discrepancies in risk factors were related to negative outcomes, but this seems do not necessarily to be true for parental favoritism. Several explanations are possible. According to the divergent realities approach, parent–child discrepancies in perceptions of family attributes (e.g., parenting) are due to their different developmental lenses in perceiving family attributes (Welsh et al. 1998). In the current study, most of the children were in the stage of early adolescence. Thus, according to the generational stake hypothesis (Bengtson and Kuypers 1971), parents tend to perceive family process (e.g., parenting) more positively because they devote significant time and effort to their family; on the contrary, during the stage of early adolescence, children seek their own identity and strive for autonomy and independence from their parents as an indication of individuation (Grotevant and Cooper 1986). They tend to become critical of family socialization, which demonstrates a sign of maturation. From this perspective, parent–child discrepancies are regarded as a normal developmental process, which may have no impact on externalizing and internalizing problems.

Furthermore, the findings that the convergence of high levels of parental favoritism is positively associated with children's internalizing and externalizing problems are partly in line with previous studies. These findings provide some evidence for the idea that parental favoritism is associated with more negative developmental outcomes even for favored children (Meunier et al. 2012). As argued by the distributive justice framework (Deutsch 1985), individuals notice the disjunction between what they receive and what they feel they deserve. Thus, being the recipient of

preferred treatment from parents may lead to maladjustment for the favored child because they may feel that they derive benefits that are unwarranted (Kowal et al. 2002). In addition, parental favoritism may lead to competition and negative relationships among siblings (Boll et al. 2003; Gilligan et al. 2013). And researchers have indicated that more negative sibling relationships can increase the risk of negative outcomes in children (Buist et al. 2013; Garcia et al. 2000)

There are several theoretical and methodological implications of this study. Theoretically, the study examined how parent–child information discrepancies on parental favoritism are related to children's internalizing and externalizing problems in Chinese families. Because previous related studies mainly used single-informant reports (e.g., Suitor et al. 2015), there has been less emphasis on information discrepancies related to parental favoritism. Thus, the findings of the present study provide important theoretical implications for the understanding the influence of parental favoritism in the Chinese families. Moreover, the findings of the study provide some empirical supports for the operations triad model in interpretations of multi-informant assessments. Methodologically, by using polynomial regression analysis with response surface analysis, this study overcomes the shortcomings of different scores, such as low reliability, ambiguous interpretation of results and confounded effects (Laird and De Los Reyes 2013).

Despite the above strengths, some limitations should be mentioned. First, this study was cross-sectional; therefore, any conclusions about the causal directions of the reported relationships cannot be drawn. Thus, a longitudinal study is suggested in the future. Second, the sample of the present study was fairly homogeneous, consisting largely of two-child (under one child policy), intact two parent Chinese families. And it has been revealed that the family contextual factors (e.g., family type) would be statistically predictive of parental favoritism (Atzaba-Poria and Pike 2008). Therefore, caution should be exercised when generalizing these findings. Moreover, it would be beneficial for future research to extend the study in the samples that are more diverse in terms of both ethnicity and family constellation (e.g., single-parent, more-than-two-child) to examine the generalizability of the findings to different situations. Third, because of the limitations of the analytic strategy that was used in the present study, the present study examined only direct association between parent–child discrepancies in perceived parental favoritism and children's internalizing and externalizing problems. Intervening variables such as birth order (Rohde 2003), children's gender (Moharib 2013), and the gender composition of the sibling dyads (Jensen et al. 2013) may be important.

Conclusion

Although previous studies have confirmed that there were discrepancies between child and parent reports of parental favoritism, only minimal knowledge has been gained on the predictive effects of parent–child discrepancies in parental favoritism on child development outcomes. The current study explored the effects of parent–child discrepancies in parental favoritism on children's internalizing and externalizing problems in Chinese families. Hypotheses based on the operations triad model (De Los Reyes and Ohannessian 2016) were tested, using polynomial regression analyses and response surface plots. Results indicated that both congruence in children's and mothers' perceptions of high levels of maternal favoritism and congruence in children's and fathers' perceptions of high levels of paternal favoritism were found to be associated with children's higher internalizing and externalizing problems. Hence, the current study provides some empirical supports to this operations triad model, which emphasized the points of convergence and divergence between parents' and children's reports (De Los Reyes and Ohannessian 2016), by showing that parent–child convergence of high levels of parental favoritism harmed child development in Chinese families. Furthermore, results also suggested that parent–child divergence of parental favoritism was not associated with children's internalizing and externalizing problems. Thus, the current study illustrates a more nuanced picture of the effect of parent–child divergence that it may have no effect on child development especially for early adolescents. As well as implications for theories, this study also has important implications for intervention and counseling. For example, the present study revealed that parental favoritism has negative effect on child development even for be favored, which suggested that parental favoritism may influence children via the way it is cognitively appraised by the children. In such a context, Kowal and Kramer (1997) proposed that open discussion between parents and children may be helpful for clarifying, and perhaps modifying, children's attribution and parental intention and goals.

Authors' Contributions R.L. conceived of the study, participated in its design, performed the statistical analyses, interpreted the data, and drafted the manuscript. F.C. acquired data, was involved in concept and design of the study, participated in the interpretation of the data and critically revised the manuscript. C.Y. conceived of the study, assisted with and checked the analysis, and critically revised the manuscript. X.M. conceived of the study, and critically revised the

manuscript. C.Z. conceived of the study, and critically revised the manuscript. All authors read and approved the final manuscript.

Data Sharing and Declaration The datasets generated and/or analyzed during the current study are not publicly available but are available from the corresponding author on reasonable request.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of Beijing Normal University with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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References

Allison, P. D. (2002). *Missing data*. Thousand Oaks, CA: Sage.

Aronen, E. T., & Soininen, M. (2000). Childhood depressive symptoms predict psychiatric problems in young adults. *Canadian Journal of Psychiatry*, 45, 465–470. https://doi.org/10.1177/070674370004500507.

Ashford, J., Smit, F., Van Lier, P. A., Cuijpers, P., & Koot, H. M. (2008). Early risk indicators of internalizing problems in late childhood: a 9-year longitudinal study. *Journal of Child Psychology and Psychiatry*, 49, 774–780. https://doi.org/10.1111/j.1469-7610.2008.01889.x.

Atzaba-Poria, N., & Pike, A. (2008). Correlates of parental differential treatment: parental and contextual factors during middle childhood. *Child Development*, 79(1), 217–232. https://doi.org/10.1111/j.1467-8624.2007.01121.x.

Barrett Singer, A. T., & Weinstein, R. S. (2000). Differential parental treatment predicts achievement and self-perceptions in two cultural contexts. *Journal of Family Psychology*, 14, 491–509. https://doi.org/10.1037/0893-3200.14.3.491.

Bell, N. J., Rychener, S. R., & Munsch, J. (2001). Multiple views of the family and adolescent social competencies. *Journal of Research on Adolescence*, 11, 375–400. https://doi.org/10.1111/1532-7795.00017.

Bengtson, V. L., & Kuypers, J. A. (1971). Generational differences and the developmental stake. *Aging and Human Development*, 2, 249–260. https://doi.org/10.2190/AG.2.4.b.

Boll, T., Ferring, D., & Filipp, S.-H. (2003). Perceived parental differential treatment in middle adulthood: curvilinear relations with individuals' experienced relationship quality to sibling and parents. *Journal of Family Psychology*, 17(4), 472–487. https://doi.org/10.1037/0893-3200.17.4.472.

Brody, G. H., & Stoneman, Z. (1990). Siblings relationship. In G. H. Brody & I. E. Sigel (Eds.), *Methods of family research: Biograhies of research projects, Vol. 1: Normal families* (pp. 189–212). Hillsdale, NJ, England: Lawrence Erlbaum Associates.

Brody, L. R., Copeland, A. P., Sutton, L. S., Richardson, D. R., & Guyer, M. (1998). Mommy and daddy like you best: perceived family favoritism in relation to affect, adjustment and family process. *Journal of Family Therapy*, 20(3), 269–291. https://doi.org/10.1111/1467-6427.00087.

Box, G. E., & Draper, N. R. (1987). *Empirical model-building and response surfaces*. New York, NY: Wiley.

Buist, K. L., Dekovic, M., & Prinzie, P. (2013). Sibling relationship quality and psychopathology of children and adolescents: a meta-analysis. *Clinical Psychology Review*, 33, 97–106. https://doi.org/10.1016/j.cpr.2012.10.007.

Bush, A. H., & Perry, M. (1992). The aggression Questionnaire. *Journal of Personality and Social Psychology*, 63(3), 452–459. https://doi.org/10.1037/0022-3514.63.3.452.

Coldwell, J., Pike, A., & Dunn, J. (2008). Maternal differential treatment and child adjustment: a multi-informant approach. *Social Development*, 17(3), 596–612. https://doi.org/10.1111/j.1467-9507.2007.00440.x.

De Los Reyes, A. (2011). Introduction to the special section: more than measurement error: discovering meaning behind informant discrepancies in clinical assessments of children and adolescents. *Journal of Clinical Child and Adolescent Psychology*, 40, 1–9. https://doi.org/10.1080/15374416.2011.533405.

De Los Reyes, A., Augenstein, T. M., Wang, M., Thomas, S. A., Drabick, D. A. G., Burgers, D. E., & Rabinowitz, J. (2015). The validity of the multi-informant approach to assessing child and adolescent mental health. *Psychological Bulletin*, 141, 858–900. https://doi.org/10.1037/a0038498.

De Los Reyes, A., Goodman, K. L., Kliewer, W., & Reid-Quiñones, K. (2010). The longitudinal consistency of mother–child reporting discrepancies of parental monitoring and their ability to predict child delinquent behaviors two years later. *Journal of Youth and Adolescence*, 39, 1417–1430. https://doi.org/10.1007/s10964-009-9496-7.

De Los Reyes, A., & Kazdin, A. E. (2004). Measuring informant discrepancies in clinical child research. *Psychological Assessment*, 16, 330–334. https://doi.org/10.1037/1040-3590.16.3.330.

De Los Reyes, A., & Kazdin, A. E. (2005). Informant discrepancies in the assessment of childhood psychopathology: a critical review, theoretical framework, and recommendations for further study. *Psychological Bulletin*, 131, 483–509. https://doi.org/10.1037/0033-2909.131.4.483.

De Los Reyes, A., & Ohannessian, C. M. (2016). Introduction to the special issue: discrepancies in adolescent–parent perceptions of the family and adolescent adjustment. *Journal of Youth and Adolescence*, 45, 1957–1972. https://doi.org/10.1007/s10964-016-0533-z.

De Los Reyes, A., Salas, S., Menzer, M. M., & Daruwala, S. E. (2013). Criterion validity of interpreting scores from multi-informant statistical interactions as measures of informant discrepancies in psychological assessments of children and adolescents. *Psychological Assessment*, 25, 509–519. https://doi.org/10.1037/a0032081.

Deutsch, M. (1985). *Distributive justice: A social psychological perspective*. New Haven, CT: Yale University Press.

Eagly, A. H., Wood, W., & Diekman, A. B. (2000). Social role theory of sex differences and similarities: a current appraisal. In T. Eckes & H. M. Trautner (Eds), *The developmental social psychology of gender* (pp. 123–174). Mahwah, NJ: Lawrence Erlbaum.

Edwards, J. R. (2002). Alternatives to difference scores: polynomial regression analysis and response surface methodology. In F. Drasgow & N. W. Schmitt (Eds), *Advances in measurement and data analysis* (pp. 350–400). San Francisco: Jossey-Bass.

Edwards, J. R., & Parry, M. E. (1993). On the use of Polynomial Regression Equations as an alternative to difference scores in organizational research. *Academy of Management Journal*, *36*, 1577–1613. https://doi.org/10.2307/256822.

Feinberg, M. E., & Hetherington, E. M. (2001). Differential parenting as a within-family variable. *Journal of Family Psychology*, *15*, 22–37. https://doi.org/10.1037/0893-3200.15.1.22.

Feinberg, M. E., Howe, G. W., Reiss, D., & Hetherington, E. M. (2000). Relationship between perceptual differences of parenting and adolescent antisocial behavior and depressive symptoms. *Journal of Family Psychology*, *14*, 531–555. https://doi.org/10.1037/0893-3200.14.4.531.

Ferdinand, R. F., van der Ende, J., & Verhulst, F. C. (2004). Parent-adolescent disagreement regarding psychopathology in adolescents from the general population as a risk factor for adverse outcome. *Journal of Abnormal Psychology*, *113*, 198–206. https://doi.org/10.1037/0021-843x.113.2.198.

Franken, A., Laceulle, O. M., Van Aken, M. A. G., & Ormel, J. (2017). Using response surface analysis to interpret the impact of parent–offspring personality similarity on adolescent externalizing problems. *European Journal of Personality*, *31*(1), 104–117. https://doi.org/10.1002/per.2088.

Garcia, M. M., Shaw, D. S., Winslow, E. B., & Yaggi, K. E. (2000). Destructive sibling conflict and the development of conduct problems in young boys. *Developmental Psychology*, *36*, 44–53. https://doi.org/10.1037/0012-1649.36.1.44.

Gaylord, N. K., Kitzmann, K. M., & Coleman, J. K. (2003). Parents' and children's perceptions of parental behavior: associations with children's psychosocial adjustment in the classroom. *Parenting Science and Practice*, *31*, 23–47. https://doi.org/10.1207/s15327922par0301_02.

Gilligan, M., Suitor, J. J., Kim, S., & Pillemer, K. (2013). Differential effects of mothers' and fathers' favoritism on sibling relations in adulthood. *Journal of Gerontology: Social Sciences*, *68*, 593–598. https://doi.org/10.1093/geronb/gbt039.

Guion, K., Mrug, S., & Windle, M. (2008). Predictive value of informant discrepancies in reports of parenting: relations to early adolescents' adjustment. *Journal of Abnormal Child Psychology*, *37*(1), 17–30. https://doi.org/10.1007/s10802-008-9253-5.

Godshalk, V. M., & Sosik, J. J. (2000). Does mentor-protégé agreement on mentor leadership behavior influence the quality of mentoring relationships? *Group & Organization Management*, *25*, 291–317. https://doi.org/10.1177/1059601100253005.

Goodman, K. L., De Los Reyes, A., & Bradshaw, C. P. (2010). Understanding and using informants' reporting discrepancies of youth victimization: a conceptual model and recommendations for research. *Clinical Child and Family Psychology Review*, *13*, 366–383. https://doi.org/10.1007/s10567-010-0076-x.

Grotevant, H. D., & Cooper, C. R. (1986). Individuation in family relationships: a perspective on individual differences in the development of identity and role-taking skills in adolescence. *Human Development*, *29*, 82–100. https://doi.org/10.1159/000273025.

Hom, P. W., Griffeth, R. W., Palich, L. E., & Bracker, J. S. (1999). Revisiting met expectations as a reason why realistic job previews work. *Personnel Psychology*, *52*, 97–112. https://doi.org/10.1111/j.1744-6570.1999.tb01815.x.

Jeannin, R., & Van Leeuwen, K. (2015). Associations between direct and indirect perceptions of parental differential treatment and child socio-emotional adaptation. *Journal of Child and Family Studies*, *24*(6), 1838–1855. https://doi.org/10.1007/s10826-014-9987-3.

Jensen, A. C., Whiteman, S. D., Fingerman, K. L., & Birditt, K. S. (2013). "Life still isn't fair": parental differential treatment of young adult siblings. *Journal of Marriage and Family*, *75*(2), 438–452. https://doi.org/10.1111/jomf.12002.

Kowal, A. K., & Kramer, L. (1997). Children's understanding of parental differential treatment. *Child Development*, *68*(1), 113–126. https://doi.org/10.1111/j.1467-8624.1997.tb01929.x.

Kowal, A., Kramer, L., Krull, J. L., & Crick, N. R. (2002). Children's perceptions of the fairness of parental preferential treatment and their socioemotional well-being. *Journal of Family Psychology*, *16*(3), 297–306. https://doi.org/10.1037/0893-3200.16.3.297.

Kowal, A. K., Krull, J. L., & Kramer, L. (2006). Shared understanding of parental differential treatment in families. *Social Development*, *15*, 276–295. https://doi.org/10.1046/j.1467-9507.2006.00341.x.

Laird, R. D., & De Los Reyes, A. (2013). Testing informant discrepancies as predictors of early adolescent psychopathology: why difference scores cannot tell you what you want to know and how polynomial regression may. *Journal of Abnormal Child Psychology*, *41*(1), 1–14. https://doi.org/10.1007/s10802-012-9659-y.

Laird, R. D., & Weems, C. F. (2011). The equivalence of regression models using difference scores and models using separate scores for each informant: implications for the study of informant discrepancies. *Psychological Assessment*, *23*, 388–397. https://doi.org/10.1037/a0021926.

Leung, J. T. Y., & Shek, D. T. L. (2012). Parental differences in family processes in Chinese families experiencing economic disadvantage. *Géneros*, *1*, 242–273. https://doi.org/10.4471/generos.2012.12.

Lewis, C., & Lamb, M. E. (2003). Fathers' influence on children's development: the evidence from two-parent families. *European Journal of Psychology of Education*, *18*, 211–228. https://doi.org/10.1007/BF03173485.

Lippold, M. A., Greenberg, M. T., & Collins, L. M. (2013). Parental knowledge and youth risky behavior: a person oriented approach. *Journal of Youth and Adolescence*, *42*, 1732–1744. https://doi.org/10.1007/s10964-012-9893-1.

Little, R. J., & Rubin, D. B. (2002). *Statistical analysis with missing data*. New York, NY: Wiley.

Longmore, M. A., Manning, W. D., & Giordano, P. C. (2013). Parent–child relationships in adolescence. In M. A. Fine & F. D. Fincham (Eds), *Handbook of family theories: a content-based approach* (pp. 28–50). New York, NY: Routledge.

Maggs, J. L., Patrick, M. E., & Feinstein, L. (2008). Childhood and adolescent predictors of alcohol use and problems in adolescence and adulthood in the National Child Development Study. *Addiction*, *103*(s1), 7–22. https://doi.org/10.1111/j.1360-0443.2008.02173.x.

Mazza, J. J., Abbott, R. D., Fleming, C. B., Harachi, T. W., Cortes, R. C., Park, J., & Catalano, R. F. (2009). Early predictors of adolescent depression a 7-year longitudinal study. *The Journal of Early Adolescence*, *29*, 664–692. https://doi.org/10.1177/0272431608324193.

McHale, S. M., Crouter, A. C., & Osgood, D. W. (2008). Linkages between parents' differential treatment, youth depressive symptoms, and sibling relationships. *Journal of Marriage and the Family*, *70*, 480–494. https://doi.org/10.1111/j.1741-3737.2008.00495.x.

McKinney, C., & Renk, K. (2008). Differential parenting between mothers and fathers: Implications for late adolescents. *Journal of Family Issues*, *29*, 806–827. https://doi.org/10.1177/0192513x07311222.

Meunier, J. C., Bisceglia, R., & Jenkins, J. M. (2012). Differential parenting and children's behavioral problems: Curvilinear associations and mother-father combined effects. *Developmental Psychology*, *48*(4), 987–1002. https://doi.org/10.1037/a0026321.

Meunier, J. C., Roskam, I., Stievenart, M., De Moortele, G. V., Browne, D. T., & Wade, M. (2012). Parental differential treatment, child's externalizing behavior and sibling relationships: bridging links with child's perception of favoritism and personality, and parents' self-efficacy. *Journal of Social and Personal*

Relationships, 29(5), 612–638. https://doi.org/10.1177/0265407512443419.

Meunier, J. C., Wade, M., & Jenkins, J. M. (2012). Mother's differential parenting and children's behavioral outcomes: Exploring the moderating role of family and social context. *Infant and Child Development*, 21(1), 107–133. https://doi.org/10.1002/icd.763.

Minuchin, P. (1985). Families and individual development: provocations from the field of family therapy. *Child Development*, 56, 289–302. https://doi.org/10.2307/1129720.

Moharib, N. I. (2013). Effects of parental favoritism on depression and aggression in Saudi Arabian adolescents. *Social Behavior and Personality*, 41(9), 1497–1510. https://doi.org/10.2224/sbp.2013.41.9.1497.

Nelemans, S. A., Branje, S. J. T., Hale, W. W., Goossens, L., Koot, H. M., Oldehinkel, A. J., & Meeus, W. H. J. (2016). Discrepancies Between Perceptions of the Parent–Adolescent Relationship and Early Adolescent Depressive Symptoms: An Illustration of Polynomial Regression Analysis. *Journal of Youth and Adolescence*, 45(10), 2049–2063. https://doi.org/10.1007/s10964-016-0503-5.

Perris, C., Jacobsson, L., Lindström, H., Von Knorring, L., & Perris, H. (1980). Development of a new inventory for assessing memories of parental rearing behavior. *Acta Psychiatrica Scandinavica*, 61, 265–274. https://doi.org/10.1111/j.1600-0447.1980.tb00581.x.

Richmond, M. K., Stocker, C. M., & Rienks, S. L. (2005). Longitudinal associations between sib-ling relationship quality, parental differential treatment, and children's adjustment. *Journal of Family Psychology*, 19(4), 550–559. https://doi.org/10.1037/0893-3200.19.4.550.

Rohde, P. (2003). Perceived parental favoritism, closeness to kin, and the rebel of the family The effects of birth order and sex. *Evolution and Human Behavior*, 24(4), 261–276. https://doi.org/10.1016/s1090-5138(03)00033-3.

Rolan, E., & Marceau, K. (2018). Individual and sibling characteristics: parental differential treatment and adolescent externalizing behaviors. *Journal of Youth and Adolescence*, 47(12), 2535–2553. https://doi.org/10.1007/s10964-018-0892-8.

Rubin, D. B. (2003). Discussion on multiple imputation. *International Statistical Review*, 71, 619–625. https://doi.org/10.1111/j.1751-5823.2003.tb00216.x.

Schönbrodt, F. D. (2016b). Testing fit patterns with polynomial regression models. Retrieved from https://osf.io/ndggf/.

Schönbrodt, F. D. (2016a). RSA: An R package for response surface analysis (version 0.9.10). Retrieved from http://cran.r-project.org/web/packages/RSA/index.html.

Shanock, L., Baran, B. E., Gentry, W. A., Pattison, S., & Heggestad, E. D. (2010). Polynomial regression with response surface analysis: a powerful approach for examining moderation and overcoming limitations of difference scores. *Journal of Business and Psychology*, 25(4), 543–554. https://doi.org/10.1007/s10869-010-9183-4.

Shek, D. T. (2002). Chinese adolescents' perceptions of family functioning: personal, school-related, and family correlates. Genetic, Social, and General Psychology Monographs, 128(4), 358–380. http://apps.webofknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=4&SID=8Fbe7TVnbqNl1Qh52wP&page=1&doc=1.

Suitor, J. J., Gilligan, M., Peng, S., Jung, J. H., & Pillemer, K. (2015). Role of perceived maternal favoritism and disfavoritism in adult children's psychological well-being. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, https://doi.org/10.1093/geronb/gbv089.

Suitor, J. J., Sechrist, J., Gilligan, M., & Pillemer, K. (2011). Intergenerational relations in later-life families. In R. A. Settersten & J. L. Angel (Eds), *Handbook of sociology of aging* (pp. 161–178). New York, NY: Springer.

Suitor, J. J., Sechrist, J., Plikuhn, M., Pillemer, K., & Pardo, S. T. (2008). Within-family differences in parent–child relations across the life course. *Current Directions in Psychological Science*, 17(5), 334–338. https://doi.org/10.1111/j.1467-8721.2008.00601.x.

Wang, X. D, Wang, X. L., & Ma, H. (1999). Rating scale for mental health. (pp. 161–167). Beijing: Chinese Mental Health.

Welsh, D. P., Galliher, R. V., & Powers, S. I. (1998). Divergent realities and perceived inequalities: adolescents', mothers', and observers' perception of family interactions and adolescent psychological functioning. *Journal of Adolescent Research*, 13, 377–402. https://doi.org/10.1177/07435548981340.

Woodward, L. J., & Fergusson, D. M. (2001). Life course outcomes of young people with anxiety disorders in adolescence. *Journal of the American Academy of Child & Adolescent Psychiatry*, 40(9), 1086–1093. https://doi.org/10.1097/00004583-200109000-00018.

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