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EMPIRICAL RESEARCH

Item-Level Discordance in Parent and Adolescent Reports of Parenting Behavior and Its Implications for Adolescents' Mental Health and Relationships with Their Parents

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Abstract The phenomenon of discordance between parents' and children's ratings of the child's mental health symptoms or of parenting behavior until recently has been treated as a problem of reliability. More recent work has sought to identify factors that may influence discordance, yet much remains to be learned about why informants' ratings of developmental phenomena are discordant and the meaning of such discordance. This study examined the extent to which discordance can be treated as a measure of the difference between two equally valid perceptions, and as such an indicator of the quality of the parent–adolescent relationship. One category of concordance and three patterns of discordance were derived from item-level differences in ratings of affection, control, and punitiveness provided by a diverse sample (53% female; 46% Hispanic-American, 35% African-American, 15% European-American, 4% another race/ethnicity) of 484 adolescents aged 12–20 years (M = 15.67, SD = 1.72) and their parents. Over and above adolescents' and parents' independent ratings of parenting, the discordance between these ratings was found to predict adolescent reports of anxiety and conduct disorder symptoms, as well as the quality of the parent–adolescent relationship. This was particularly true when adolescents and parents were discordant in their ratings of affection and when adolescents rated their parents higher on affection than did parents themselves. Implications of these findings and future research directions are discussed.

Keywords Concordance · Informant discrepancies · Parenting · Mental health · Parent-child relationship · Adolescent

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Introduction

Research in adolescent psychology and related disciplines often relies on individuals' ratings of their own or others' behaviors or mental states. Researchers whose work uses such ratings often strive to secure the most valid assessments possible by using multiple raters or objective raters. The use of ratings across multiple raters has prompted concern about concordance (or its reverse, discordance) among raters (De Los Reyes and Kazdin 2005). Concordance/discordance (hereafter, discordance) can be operationalized as the level of disagreement or lack of overlap between two people rating the same phenomena. The majority of work concerning discordance among raters has focused on deriving the most "accurate" assessments of children, in particular children's mental health symptoms (e.g., Ehrlich et al. 2011). There is a clear need in the literature on discordance for investigations of the underlying *meaning* of discordance and its implications for the diagnosis and treatment of child and adolescent mental psychopathology (De Los Reyes 2011).

Despite this recent push to better understand the meaning of discordance and the characteristics of individuals, relationships, and contexts that may be associated with discordance in ratings of adolescent mental health and behavior (e.g. De Los Reyes and Kazdin 2005; Renk et al. 2008), few studies have examined discordance between parents and children in their ratings of *parental* behavior. Investigation of parenting is important given that parenting behaviors have been clearly and consistently been shown to be related to adolescents' behaviors and mental health (e.g. Allen et al. 2007; Steinberg 2001). For practical reasons, the vast majority of studies rely on parent and/or adolescent reports of parenting behavior rather than on observer ratings. Yet, there is a growing recognition that ratings from a single rater to describe a relationship can yield incomplete or inconsistent information (Bogenschneider and Pallock 2008). For example, parent and adolescent ratings of parenting behavior may diverge as a result of their perceptual biases, namely that they "see" different things in the relationship. If one of the pair also provides data on the outcome of interest (e.g., adolescents' reporting on their mental health symptoms), their ratings may also diverge as a result of shared method variance. That said, individual ratings of perceived parenting are often preferred as it is an adolescent's perception that will drive their assessments of and reactions to parenting.

Discordance between parent and adolescent ratings may thus be endemic to the study of parent–adolescent relationships, which raises the question of whether such discordance might be used as an indicator of the quality of the parent–adolescent relationship in and of itself. There have been a limited number of attempts to do so. One of the first of such efforts examined correlations among four family members (college student, sibling, mother, and father) in ratings of parenting behavior and found relatively low agreement across family members (mean $r = .30$). Perhaps not surprisingly, parents were more likely to rate themselves (and each other) favorably than were their children (Schwarz et al. 1985). Another study found that, compared to mothers' ratings of parenting behavior, adolescents' ratings of parenting behavior were more strongly correlated with observers' ratings and thus were judged to be more "valid" (Gonzales et al. 1996, p. 1492). A third study compared young adolescents' and their parents' ratings of parenting behavior and found low levels of agreement, with correlations between .13 and .36 for mother–adolescent agreement and between .19 and .31 for father–adolescent agreement (Tein et al. 1994). Lastly, a study examining adolescents' and parents' ratings of parental monitoring found correlations between adolescent and parent ratings ranging from .23 to .33 (De Los Reyes et al. 2010). These findings of low-to-modest agreement among family members about parenting behavior have engendered the observation that individual family member's ratings contain "a small portion of true score variance and a substantial portion of systematic error" (Schwarz et al. 1985, p. 478). In other words, children and parents agree surprisingly little when it comes to describing parenting behavior.

Recent research has prompted several different theories to explain potential reasons for parent–child discordance in ratings of mental health that may help contribute to our understanding of parent–adolescent discordance in ratings of parenting. Achenbach, McConaughy and Howell (1987) proposed that the visibility of behaviors is a key factor that may influence parent–adolescent discordance with lower levels of parent–child discordance for more visible behaviors (e.g. aggression, conduct disorder) compared to less visible behaviors (e.g. depression, anxiety). Building from the idea of visibility, other researchers contend that informants' ratings of adolescent mental health are comprised of each informant's unique perception of a given adolescent's mental health in combination with consistent characteristics of the adolescent's mental health that remain the same across informants and contexts (Rowe and Kandel 1997). Given that interpersonal interactions are likely to be subject to variation in the visibility of behaviors along with informants' perceptions of these behaviors, it is therefore not surprising that discordance between parents' and adolescents' ratings of parenting is high.

In their study of cross-informant ratings, Renk et al. (2008) argued that communication between parents and adolescents may be a key factor influencing parents' perceptions of their adolescents' emotional and behavioral functioning. Further, parent–child discordance in ratings of adolescent mental health is highest among adolescents whose relationships with their parents are characterized by insecurity of attachment (Berger et al. 2005; Ehrlich et al. 2011). These studies lend credence to the idea that discordance may, indeed, be a reflection of the quality of the parent–adolescent relationship and that exploration of the association between parent–adolescent discordance in ratings of parenting practices and aspects of the parent–adolescent relationship such as communication, trust and alienation is warranted. Additionally, investigation of how communication, trust and alienation relate to parent–adolescent discordance may further our understanding of why discordance in parents' and adolescents' ratings developmental phenomena may occur.

When it comes to operationalizing discordance, researchers have employed several tactics. A primary method has been to aggregate across raters' average scores or to compute a canonical correlation. However, instead of indicating a satisfying statistical correction for discordance, such research has found that parent and adolescent ratings are distinct and therefore do not lend themselves well to

efforts at combining them. Indeed, in a study that compared parent and adolescent ratings of parents' involvement and acceptance as predictors of adolescents' academic success (Pelegrina and Garcia-Linares 2003), the authors concluded that aggregating across parent and adolescent reports did not provide better predictions of academic outcomes than adolescent reports alone. Further support for the unique contribution of child/adolescent and parent ratings of parent behavior comes from a study that used canonical correlations to compare within-source relationships between variables to across-source relationships between variables (Bruce et al. 2006). Child-reports of parenting were found to be stronger predictors of child-reports of their own depressive symptoms than were parent-reports, a finding that led the authors to conclude that children's and parents' reports are qualitatively different constructs that can be unique predictors of child outcomes (Bruce et al. 2006).

While there is a growing body of research recognizing the distinctiveness of parent and adolescent ratings that has largely abandoned attempts to aggregate or combine parent and adolescent ratings, the strategies employed to date in these studies to operationalize discordance do not fully capture the full range of discordance patterns that may occur between parent and adolescent ratings. Studies examining the unique contributions of parent and adolescent reports to outcomes of interest and the extent to which associations between parents' and adolescents' ratings and outcomes may differ have tended to rely on correlations among raters' mean scale scores (see Achenbach et al. 1987, for review; or more recently Renk et al. 2008).

Taken together, these results indicate that the discordance between parent and adolescent ratings may be an important marker of the quality of the parent–adolescent relationship and not merely a statistical problem to be corrected away. We argue that discordance between parents and children in ratings of parent behavior in particular may be an important predictor of both adolescent mental health and of the quality of the parent–adolescent relationship. We argue that such discordance is evidence of poor communication, lack of trust, and heightened alienation among adolescents and parents and, as such, a reflection of a more problematic parent–adolescent relationship. In support of this hypothesis, parent–child discordance in ratings of adolescent mental health is highest among adolescents whose relationships with their parents are characterized by insecurity of attachment (Berger et al. 2005; Ehrlich et al. 2011), while adolescents whose relationships with their parents are characterized by attachment security are more likely to have open communication and positive relationships with parents and are less likely to report internalizing and externalizing behaviors (Ehrlich et al. 2011). Because the quality of parent–adolescent relationships has been found to predict adolescent internalizing and externalizing symptoms (Allen et al. 2007; Brumariu and Kerns 2010), we expect that adolescents in discordant adolescent–parent dyads will report higher levels of mental health problems and more problematic relationships with their parents. Indeed, a study examining discordance in parent–adolescent ratings of the parent–child relationship (with discordance operationalized as absolute difference between scores—see below) found that discordance was associated with increased internalizing and externalizing behaviors among adolescents (Pelton and Forehand 2001) indicating that some support for this prediction has been found.

Despite the apparent need to accurately measure and investigate parent–child discordance, previous attempts to characterize discordance have suffered from several limitations. Past studies have tended to rely on correlations among raters' mean scale scores (see Achenbach et al. 1987, for review) or on differences between the raters' raw or standardized mean scores to operationalize discordance between raters (Berger et al. 2005; De Los Reyes et al. 2011; Pelton and Forehand 2001). Both of these methods are problematic because they may obscure true differences. To illustrate, consider a dyad in which the parent gives item ratings of 1, 3, 5, 3, and 1 on a 5-point scale; his or her average would be 2.6. If the adolescent in this dyad gives ratings of 3, 5, 1, 1, and 3 for the same order of items, he or she also would have an average of 2.6. Thus, their averaged ratings would be perfectly correlated ($r = 1.0$), and differencing their means would also indicate perfect concordance ($2.6 - 2.6 = 0$ disagreement). Yet, both the correlation and mean difference are misleading in this case. The differences at the item level (-2, -2, 4, 2, and -2) indicate that parent and child in fact differed by two or more points on all five items and thus were far from concordant. It is clear that previous methods of calculating discordance that compare average ratings risk underestimating the differences in the ratings of adolescents and parents and might erroneously group parent–child dyads that are discordant along with concordant dyads when conducting analyses.

A second problem with comparing average parent and adolescent ratings is that doing so does not allow researchers to determine whether there are patterns in the disagreements. Knowing whether one person in the dyad consistently rates parenting as higher than does the other can be important for understanding how parenting is associated with individuals' mental health. For example, an adolescent who consistently rates his mother as less affectionate than his mother rates herself is likely indicating that his mother is less affectionate than the adolescent would like her to be, which in turn may predict higher levels of mental health problems in the adolescent. In the

example above, the adolescent provided higher ratings than the parent three out of five times, while the parent was higher twice, and in no instance did they provide identical ratings for the same item, indicating an overall pattern of discordance. We are aware of no studies that have examined whether the direction of the disagreements between parents and adolescents in their item ratings of parenting in addition to an overall pattern of discordance has implications for adolescent mental health or for the quality of the parent–adolescent relationship.

We argue that calculating discordance at the item-level and in a way that preserves the direction of the disagreement will be both more accurate and more informative. Such a method of calculating discordance would allow researchers to differentiate dyads with various patterns of agreement or disagreement. In this study, we are interested in four potential patterns, namely a *parent higher pattern*, in which the parent consistently rates herself or himself higher on a scale than the adolescent does, an *adolescent higher pattern* when the adolescent rates the parent higher than the parent rates herself or himself, a *mutually discordant* pattern, in which there is an overall high level of disagreement alternating between the parent sometimes providing a higher rating and sometimes the adolescent doing so, and a *concordant pattern* in which the parent and adolescent rarely disagree. We are aware of one study that calculated item-level discordance between parent and teacher ratings of children's behavior problems, but this study then aggregated the item-level discordance (Cai et al. 2004). We are unaware of any studies to date that have operationalized discordance between adolescents' and parents' respective ratings of parenting behavior in a way that preserves the amount and direction of discrepancies at the item level (although see Ehrlich et al. (2011) for an example of direction of discordance in parent–adolescent ratings of adolescent depression).

Current Study

In the present study, our first goal was to create an index of parent–adolescent discordance in parenting ratings that reflected their disagreements at the item-level and that captured the valence of their disagreements (i.e., who had the higher rating). Our second goal was to link parent–adolescent discordance in parenting ratings to adolescent mental health and the quality of the parent–adolescent relationship. We focused on three aspects of parental behavior, namely affection, control, and punitiveness, that have been shown to be associated with adolescent mental health and the quality of their relationships with their parents (Darling and Steinberg 1993; Steinberg 2001). We sought to test the following hypotheses.

We predicted that both parent and adolescent individual ratings of affection will predict fewer adolescent mental health symptoms and higher parent–child relationship quality, while parent and adolescent ratings of control and punitiveness will predict more symptoms and lower relationship quality (Hypothesis 1). We further anticipated that, for all three aspects of parenting, adolescents in highly discordant dyads will report more mental health symptoms and lower quality relationships with their parents over and above the parent and adolescent ratings of parenting (Hypothesis 2). We expected that, for ratings of parental affection, when adolescents are concordant with or higher than their parents' ratings of affection, they will report lower mental health symptoms and higher quality relationships with their parents (Hypothesis 3). We also expected that, for ratings of parental control and punitiveness, adolescents who report higher levels than do their parents will report more mental health symptoms and lower quality relationships with their parents (Hypothesis 4).

These hypotheses were tested with one wave of data from a racially, ethnically, and economically diverse sample of youth and their parents living in New York City who participated in a larger longitudinal study. All youth and their parents independently rated three dimensions of the parents' behaviors using the same questionnaire. Adolescents also provided ratings of their own mental health symptoms and of the quality of their relationships with their parents. Given previous research pointing to the importance of parental practices to both adolescent mental health and the parent–adolescent relationship, investigation of discordance in parents' and adolescents' ratings of parenting practices as potential additional indicator of parenting may provide further insight as to the foundation for problematic parent–adolescent relationships. Utilizing research methodology that allows us to capture both the direction and level of discordance in ratings of parenting practices is an important step in this effort.

Method

Participant Recruitment

Families for this study participated in a long-term follow-up of an evaluation of the Resolving Conflict Creatively Program, one of the largest school-based violence prevention programs in the country. The original study included four assessments across 2 years (2002–2004) of all students at the 15 participating schools in New York City. Students who were severely mentally or physically challenged, as identified by school principals, were excluded from the study. Otherwise, all students in each of the participating schools were included in the study unless a "refusal to participate"

form was returned by a parent or signed by a student, or if the student was discharged from the school. This passive consent procedure, approved both by the Office of Educational Research at the New York City Board of Education and the Institutional Review Board of Columbia University, was implemented following a waiver of active consent based on a Single Project Assurance, submitted to the Office for Protection from Research Risks of the National Institutes of Health, Department of Health and Human Services. For a full description of the design and rationale of the evaluation, please see Aber et al. (1998, 2003), and Brown et al. (2004). Families were recruited to participate in the follow-up assessment through mailings and phone calls using contact information obtained from the New York City Department of Education. Recruitment letters were written in both English and Spanish.

Participants

The full sample for the follow-up study included 908 youth; however, we were only able to obtain parent interviews for 498 of these youth; it is these parent–adolescent dyads that were the sample for the present study. Four dyads were excluded because one of the participants had missing data on the parenting measure of interest, resulting in 494 adolescent–parent dyads for the current study. Adolescents ranged in age from 12 to 20 years, with an average age of 16 years (*mean* = 15.67, SD = 1.72). The adolescent sample was 46% Hispanic-American, 35% African-American, 15% European-American, and 4% of another race/ethnicity. Forty-seven percent of the sample was male ($n = 234$) and fifty-three percent of the sample was female ($n = 260$). The parents averaged 43 years of age (SD = 7.18); 43 of the parents were male (9%). Half of the parents reported that they were married (50%). The racial-ethnic composition of the parent sample was similar to the adolescent sample: 43% Hispanic-American, 37% African-American, 16% European-American, and 5% of another race/ethnicity. Two-thirds of the parents worked (66%). The parents reported a range of educational backgrounds: 10% had only elementary school education; 17% had attended, but not graduated from, high school; 26% were high school graduates; 27% had attended college for 1–3 years; and 20% were college graduates. Parents reported the family's annual income on a scale from 1 (less than or equal to $5,000) to 11 (over $75,000). The average family income on this scale was 6.39, SD = 2.94, which is in the range of $25,001–$30,000 per year.

Protocol

Once consent was obtained from parents and assent or consent was obtained from youths (depending on whether they were under or over 18), youth were interviewed in-person by trained research assistants for 2 to 3 h using a structured format. To maximize confidentiality, youth sat across from interviewers who read the questions aloud, and then youth entered their responses directly into laptop computers. In order to minimize any intimidation adolescents might feel, the interviewers were diverse (over half of the interviewers were racial-ethnic minorities), primarily female, and entirely young adults. The interviews primarily took place at public spaces such as community libraries or local parks, and commercial establishments such as coffee shops, or, less frequently, adolescents' homes. The students were compensated $50 for their time.

Parent interviews followed a structured format that lasted approximately 1 h. The majority of parent interviews were conducted by reading the complete questionnaire over the phone (55%). In 34% of the cases, the parent filled out a paper copy of the questionnaire in person with the interviewer, while 11% of the parents filled out the paper copy on their own and mailed it to us. Both the written and oral versions of the parent interview were available in Spanish for parents who preferred to read and/or speak Spanish; 21% of the parents were either read the Spanish version of the questionnaire or completed a paper copy of the Spanish version. Parents were compensated $25 for their time.

The vast majority of adolescent and parent interviews happened on different days and in different locations because most parents were recruited to participate only after their children had already participated. The only exceptions were if a parent accompanied their child to the interview or if the adolescent interview was conducted at home. In either of these scenarios, the parent was asked to wait out of ear-shot of the adolescent and interviewer (e.g., in another part of the library) or in another room (e.g., in the kitchen if the adolescent and interviewer were in the living room) to preserve confidentiality.

Measures

Parenting Practices

Both adolescent and parent reports of parenting practices were assessed using the Colorado Parental Child-Rearing Scale (CPCRS: George and Bloom 1997). Although items from this measure have been used successfully with adolescents in Italy, France, and French-speaking Quebec (Claes et al. 2010, 2011), we are not aware of any previous studies using a Spanish translation of the measure. The original questionnaire asks adolescents to rate their parents' child rearing practices on a 4-point scale (1 = "very untrue", 2 = "fairly untrue", 3 = "fairly true", and 4 = "very true"). For the current study, we asked

adolescents to complete 3 subscales from the CPCRS, namely affection (5 items; e.g., "My parents smile at me very often"), punitiveness (5 items; e.g., "My parents scold and yell at me"), and control (5 items; e.g., "My parents do not approve of my spending a lot of time away from home"). We adapted the original CPCRS to create a parent version with identical items (e.g., affection: "I smile at my child very often;" punitiveness: "I scold and yell at my child;" and control: "I do not approve of my child spending a lot of time away from home"). Each subscale was found to be internally consistent, although the internal consistency was lower for two of the adolescent-rated subscales: affection (adolescent and parent ratings, respectively): αs = .82, .78; punitiveness: αs = .57, .72; and control: αs = .56, .73. For the parent version, internal consistency was adequate for both the English and Spanish administrations of the CPCRS, with overall αs = .75 and .70, respectively.

Adolescent Mental Health

Adolescents reported their depression symptoms, conduct disorder symptoms, and anxiety disorder symptoms using the Computer Diagnostic Interview Schedule for Children-IV (C-DISC Development Group 2000). The C-DISC is a highly structured interview designed to assess DSM-IV psychiatric disorders and symptoms in children and adolescents aged 9–17 years through self-report (Shaffer et al. 2000). Previous research has found that the C-DISC-IV is answered more consistently than any other psychiatric diagnostic interview that has been prepared for either children or adults and has established reliability (C-DISC Development Group 2000; Shaffer et al. 2000). For these analyses, continuous counts of symptoms, rather than clinical cut-off scores, were used in the analyses in order to capture the full range of symptomatology. Justification for use of continuous counts of symptoms comes from Shaffer et al. (2000) who found that use of a symptom scale has better reliability than categorical diagnosis.

Adolescent Report of Parent–Child Relationship Quality

Adolescents rated the quality of their relationships with their parents measured using the Inventory of Parent and Peer Attachment (IPPA: Armsden and Greenberg 1987). The 25-item inventory includes three subscales of communication, trust, and alienation. Response options ranged from 1 (never true) to 5 (always true) on items such as, "My parents accept me as I am", and "I can count on my parents to listen when something is bothering me." Each of the subscales was found to be internally consistent with this sample: communication: $\alpha = .83$; trust: $\alpha = .88$; alienation: $\alpha = .82$.

Data Reduction

We created patterns of discordance in the parent and adolescent ratings of parenting using the following three-step process.

Step 1: Calculation of Item-Level Difference Scores

We first subtracted parent ratings on each of the 15 items of the CPCRS from their child's ratings for the same items. If a parent rated an item higher than did their child, the difference score for that item would be negative (e.g., 2 [child rating] − 4 [parent rating] = −2 [difference score]). Positive difference scores indicated items for which adolescents rated an item higher than did their parents (e.g., 4 [child rating] − 1 [parent rating] = 3 [difference score]). Because response options for the CPCRS ranged from 1 to 4, potential difference scores for each item ranged from −3 to +3. Please see the first part of Table 1 for sample distributions of item-level difference scores for 8 actual dyads from our study.

Step 2: Weighting of Item-Level Difference Scores to Indicate Rater

In order to preserve whether parenting was rated consistently higher on the four point scale by parents or adolescents, we counted the number of times a dyad's 15 paired ratings resulted in each of the seven possible item-level difference scores (e.g., −3, −2, −1, 0, 1, 2, and 3) and weighted them by the value of the difference. In order to determine which informant, parent or adolescent, perceived parenting as being more positive, two separate difference scores were calculated. One score represented the *parent higher weighted score* = (number of −3 s * − 3) + (number of −2 s * − 2) + (number of −1 s * − 1). The other score represented the *adolescent higher weighted score* = (number of +1 s * 1) + (number of +2 s * 2) + (number of +3 s * 3). The second section of Table 1 provides the calculated weighted difference scores for our 8 sample dyads.

Step 3: Creation of Discordance Patterns

The absolute values of the separate *parent weighted score* and *adolescent weighted score* for the affection, control, and punitiveness parenting subscales were divided at their respective sample medians in order to denote whether each dyad was high or low (compared to the median of the sample)) in the number of times the mother's rating was higher than the adolescent's, the adolescent's rating was higher than the mother's, or whether they were low or high in both. We created four possible patterns from these

Table 1 Demonstration of method for calculating discordance groups based on item-level differences in parent and adolescent ratings and comparison with mean difference method

Dyad	Our item-level method for calculating discordance											Typical mean difference method	
	Step 1: Determine number of item-level difference scores at each potential value							Step 2: Weight item-level difference scores		Step 3: Compare weighted scores to sample medians[d]		Our discordance group labels	Parent mean score subtracted from adolescent mean score	Mean score-based group discordance group labels
	Parent higher			Exact agreement	Adolescent higher			Parent higher weighted score[b]	Adolescent higher weighted score[c]	Parent higher pattern	Adolescent higher pattern			
	−3[a]	−2	−1	0	+1	+2	+3							
A	–	1	2	12	–	–	–	−4.0	0.0	Low	Low	Concordant	−0.27	Concordant
B	1	–	1	11	2	–	–	−4.0	2.0	Low	Low	Concordant	−0.13	Concordant
C	–	3	3	2	3	1	3	−9.0	14.0	High	High	Mutually Discordant	0.33	Concordant
D	–	3	5	2	1	2	2	−11.0	11.0	High	High	Mutually Discordant	0.00	Concordant
E	–	1	–	7	4	2	1	−2.0	11.0	Low	High	Adolescent Higher	0.60	Adolescent Higher
F	–	–	–	9	3	–	3	0.0	12.0	Low	High	Adolescent Higher	0.80	Adolescent Higher
G	2	3	3	6	–	–	1	−15.0	3.0	High	Low	Parent Higher	−0.80	Parent Higher
H	4	6	2	1	1	1	–	−26.0	2.0	High	Low	Parent Higher	−1.60	Parent Higher

[a] Value of difference (adolescent minus parent) between parent and adolescent reports at the item-level

[b] Sum of the products of the number of discrepant items by each negative difference value, i.e., (number of −3 s * − 3) + (number of −2 s * − 2) + (number of −1 s * − 1)

[c] Sum of the products of the number of discrepant items by each positive difference value, i.e., (number of +1 s * 1) + (number of +2 s * 2) + (number of +3 s * 3)

[d] Low = below median; high = above median

dichotomies from the weighted scores: low parent/low adolescent was labeled the *concordant pattern* (i.e., they rarely disagreed); high parent/high adolescent was labeled the *mutually discordant pattern* (high disagreement, sometimes mother rating self higher, sometimes the adolescent rating the parent higher); high parent/low adolescent was termed the *parent higher pattern* (high disagreement, with mother tending to rate herself higher on the scale than the adolescent); and low parent/high adolescent was named the *adolescent higher pattern* (high disagreement, with the adolescent tending to rate the mother higher on the construct than the mother rates herself). Thus, there was one way for dyads to be concordant, but three ways that they could be discordant. Previous studies that have used mean difference scores on the scale-level to determine discordance patterns (e.g. Berger et al. 2005; Pelton and Forehand 2001) are not able to capture the *mutually discordant pattern* we have observed here. Instead, these dyads are often (mistakenly) included in the *concordant pattern.* To illustrate this point, we have calculated discordance using the typical method of subtracting a dyad's mean parent score from the mean adolescent score for our 8 sample dyads in Table 1. As is shown, the mean difference method allows these two types of discordance to cancel each other out and thus mistakenly categorize dyads C and D as *concordant* when their item-level difference scores clearly indicate that in some cases the parent was substantially higher than the adolescent while in others the adolescent was substantially higher than the parent. Our item-level method distinguishes such dyads in a separate category, namely *mutually discordant*, and thereby preserves the valence of the differences and, we argue, more accurately characterizes the level of disagreement in any given dyad.

To further illustrate the utility of our method, Table 2 provides cross-tab analyses comparing the relative sample sizes for discordance groups using item-level difference scores (our method) compared with discordance groups using mean-level difference scores. Note that the item-level method creates four categories, while the mean-level method derives only three categories. For the calculation of discordance in affection ratings, 82 dyads (16%) would be

Table 2 Crosstabs comparing discordance groups resulting from item-level and mean scale-level methods

Affection	Mean-level affection discordance groups			
	Parent higher	Adolescent higher	Concordant	Totals
Item-level affection discordance groups				
Mutually discordant	30	5	25	60
Parent higher	*214*	0	0	214
Adolescent higher	0	*78*	20	98
Concordant	2	0	*120*	122
Totals	246	83	165	494
Control	Mean-level control discordance groups			
	Parent higher	Adolescent higher	Concordant	Totals
Item-level control discordance groups				
Mutually discordant	26	6	55	87
Parent higher	*150*	0	13	163
Adolescent higher	0	*126*	42	168
Concordant	2	0	*74*	76
Totals	178	132	184	494
Punitiveness	Mean-level affection discordance groups			
	Parent higher	Adolescent higher	Concordant	Totals
Item-level affection discordance groups				
Mutually discordant	1	15	58	74
Parent higher	*119*	0	75	194
Adolescent higher	0	*146*	20	166
Concordant	0	0	*60*	60
Totals	120	161	213	494

Agreements across the two methods are italized

misclassified based on the easier mean-level difference method of calculating discordance (the off-diagonals: $30 + 5 + 25 + 20 + 2 = 82$). The rates of misclassification are even higher for control and punitiveness at 29% (144 off-diagonals) and 34% (169 off-diagonals), respectively. Most, but by no means all, of these misclassifications involve the inability of the mean-level difference method to identify a mutually discordant category.

Results

The sample sizes for the discordance patterns by parenting scale were (*concordant, mutually discordant, parent higher,* and *adolescent higher*, respectively): affection subgroup *n*s = 122, 60, 214, and 98; control subgroup *n*s = 76, 87, 163, and 168; and punitiveness subgroup *n*s = 60, 74, 194, and 166. The highest rate of *concordance* was for affection (25%); concordance was low for both control (15%) and punitiveness (12%). While *mutual discordance* was similar for all three parenting scales (affection: 12%; control: 18%; punitiveness: 15%), the number of dyads in the *parent higher* pattern was highest for the affection subscale (43% vs. 33% for control and 39% for punitiveness) and the number of dyads in the *adolescent higher* pattern was equal for both control and punitiveness (34% for both vs. 20% for affection). For illustrative purposes, Table 2 provides cross-tabulation analyses comparing the relative sample sizes for discordance groups using item-level difference scores (our method) compared with discordance groups using mean scale-level difference scores. As can be seen from this table, determining discordance groups from item-level as opposed to mean-level difference scores allows for the identification of the *mutually discordant* pattern for cases that would otherwise have been categorized as *adolescent higher, parent higher* or *concordant.* Further, in taking the directionality of the agreement into consideration, calculating discordance groups at the item-level provides a more stringent definition of what can and should be accepted as agreement between parent and adolescent report resulting in a greater number of dyads in the *adolescent higher* and *parent higher* discordance patterns. Mean parent and adolescent ratings on each of the parenting subscales and mean item-level discrepancy scores are reported for each discordance group in Table 3. Descriptive information for all study variables and correlations between variables can be found in Table 4.

Table 3 Mean parent and adolescent report of parenting measures and item-level difference score by discordance groups

Variable	Parent report mean score		Adolescent report mean score		Mean item-level difference scores	
	M	SD	M	SD	M	SD
Affection						
Mutually discordant (n = 60)	3.40	0.39	3.08	0.42	4.70[a]	1.62
Parent higher (n = 214)	3.86	0.28	2.94	0.58	−4.59	2.53
Adolescent higher (n = 98)	3.36	0.50	3.77	0.29	2.67	1.99
Concordant (n = 122)	3.94	0.18	3.86	0.25	0.34	0.48
Control						
Mutually discordant (n = 87)	2.86	0.50	2.57	0.45	7.19	1.72
Parent higher (n = 163)	3.58	0.46	2.59	0.52	−5.52	2.20
Adolescent higher (n = 168)	2.41	0.61	3.07	0.56	4.94	1.94
Concordant (n = 76)	3.40	0.61	3.25	0.62	1.61	0.90
Punitiveness						
Mutually discordant (n = 74)	2.17	0.44	2.43	0.47	6.95	1.69
Parent higher (n = 194)	2.75	0.62	2.03	0.53	−5.04	2.15
Adolescent higher (n = 166)	1.64	0.53	2.60	0.57	5.41	1.94
Concordant (n = 60)	1.86	0.62	2.01	0.60	1.70	0.91

[a] For mutually discordant groups, the absolute mean item-level discrepancy score is given

To determine whether dyads' patterns of discordance for the parenting subscales were associated with adolescent mental health and with the adolescent's perceptions of the quality of the parent–adolescent relationship, we regressed each of the six outcomes separately on socio-demographic control variables (adolescent age, adolescent gender, parent gender, race/ethnicity, parent highest level of education, family income, and intervention), on the continuous parent- and adolescent-ratings of parenting, and on the set of indicators for each of the discordance groups. These regressions were repeated for the affection, control, and punitiveness discordance patterns and their results are presented in Tables 5, 6, 7. Significance levels account for Type I error by correcting for multiple-comparison hypothesis testing using the Holm–Bonferroni method (Holm 1979). Overall, females were more likely to report more depression and anxiety symptoms, while males were more likely to report conduct disorder symptoms. In models including punitiveness discordance groups, older adolescents reported more conduct disorder symptoms ($\beta = .15$, $p < .05$). Adolescent's ratings of the quality of their relationships with their parents did not depend on socio-demographic characteristics.

We turn first to the main effects proposed in Hypothesis 1. For ratings of parent affection, the F tests for all six of the regressions were significant at $p < .001$, while the percent of variance explained ranged from $R^2 = .10$ (adolescent anxiety symptoms) to $R^2 = .45$ (level of trust in the parent–child relationship). Parents' ratings of their own affection did not predict adolescent mental health symptoms or adolescents' ratings of the quality of the parent–child relationship (see Table 5). In contrast, adolescents' ratings of their parents' affection were significantly associated with five of the six outcomes; the more affectionate adolescents rated their parents, the fewer depression and conduct disorder symptoms they reported (βs $= -.26$, $p < .001$ and $-.22$, $p < .01$), the higher levels of communication with and trust in their parents they reported (βs $= .65$ and $.64$, $p < .001$), and the less alienation from their parents they reported ($\beta = -.46$, $p < .001$). These findings support Hypothesis 1.

The main effects for the ratings of control were also consistent with Hypothesis 1. Adolescent ratings of parents' control were significantly associated with adolescent depression ($\beta = .21$, $p < .05$) and anxiety ($\beta = .27$, $p < .001$) symptoms (see Table 6). Parents' ratings of higher control were associated with lower levels of adolescent-rated communication ($\beta = -.24$, $p < .05$) and trust ($\beta = -.26$, $p < .05$). In contrast, the more controlling adolescents rated their mothers, the more communication they reported in their relationships with their parents ($\beta = .23$, $p < .05$). With regard to main effects for ratings of punitiveness, only one coefficient was significant. The more punitive adolescents rated their parents, the more alienation ($\beta = .22$, $p < .05$) they reported in their relationships with their parents (see Table 7). To summarize, although not all hypothesized coefficients were significant, all paths that were significant were in the predicted direction, supporting Hypothesis 1.

Hypothesis 2 predicted that the mutually discordant pattern would be most predictive of mental health problems and poor parent–adolescent relationship quality for all

Table 4 Descriptive statistics and correlations for study variables (N = 494)

Variable			Covariates									
	M	SD	1	2	3	4	5	6	7	8	9	10
1. Age	15.64	1.82	–									
2. Adolescent gender female	–	–	−.01	–								
3. Parent gender female	–	–	−.34***	−.04	–							
4. African-American	–	–	.07	−.01	−.03	–						
5. European-American	–	–	−.06	−.07	−.02	−.30***	–					
6. Latino	–	–	−.02	.08	.05	−.68***	−.39***	–				
7. Other ethnicity	–	–	−.10*	−.06	.20***	−.15**	−.09	−.18***	–			
8. Parents' level of education[a]	4.32	1.29	−.02	−.11*	−.13**	.12*	.31***	−.34***	−.01	–		
9. Income[b]	6.36	2.94	−.03	−.10*	−.10*	−.11*	.42***	−.22***	.02	.42***	–	
10. Intervention	2.31	2.49	.01	.03	−.04	−.11*	−.17***	.19***	.07	−.15**	−.10*	–
11. Parent self-report of affection	3.72	0.42	.04	−.01	−.22***	.01	−.05	.00	.02	.00	−.04	.07
12. Adolescent-rating of parent's affection	3.35	0.62	.01	.00	−.07	−.04	−.04	.07	−.01	−.03	−.04	.03
13. Parent self-report of control	3.02	0.74	−.06	.10*	.02	−.02	−.40***	.32***	−.03	−.33***	−.38***	.08
14. Adolescent-rating of parent's control	2.85	0.61	.04	.14**	−.07	−.01	−.21***	.19***	−.06	−.24***	−.18**	.09
15. Parent self-report of punitiveness	2.19	0.75	−.11*	−.10*	.07	.17***	−.08	−.07	−.09*	−.08	−.03	−.01
16. Adolescent-rating of parent's punitiveness	2.28	0.61	−.12*	−.07	.05	.02	−.12*	.08	−.04	−.08	−.09	.08
17. Depressive symptoms	8.20	4.46	.06	.16***	.03	−.01	.05	−.01	−.04	−.05	.06	.03
18. Anxiety symptoms	4.34	2.40	−.08	.20***	.02	.04	−.06	.01	−.02	−.07	−.12**	.04
19. Conduct disorder symptoms	4.63	4.05	.11*	−.29***	.02	.05	.07	−.06	−.09*	.01	−.06	.01
20. Communication	3.61	0.73	.04	.05	−.05	−.03	.04	.04	−.07	−.01	.00	.02
21. Trust	3.93	0.71	.02	−.05	−.04	−.06	.07	.01	−.01	.05	.02	−.02
22. Alienation	2.32	0.77	−.03	.02	.07	.04	−.03	−.03	.01	−.11*	.00	.03

Variable	Parenting						Mental health			Relationship		
	11	12	13	14	15	16	17	18	19	20	21	22
1. Age												
2. Adolescent gender female												
3. Parent gender female												
4. African-American												
5. European-American												
6. Latino												
7. Other ethnicity												
8. Parents' level of education[a]												
9. Income[b]												

Table 4 continued

Variable	Parenting						Mental health			Relationship		
	11	12	13	14	15	16	17	18	19	20	21	22
10. Intervention												
11. Parent self-report of affection	–											
12. Adolescent-rating of parent's affection	.22***	–										
13. Parent self-report of control	.04	−.03	–									
14. Adolescent-rating of parent's control	.04	.24***	.30***	–								
15. Parent self-report of punitiveness	−.19***	−.11*	.27***	.04	–							
16. Adolescent-rating of parent's punitiveness	−.02	−.02	.16**	.36***	.26***	–						
17. Depressive symptoms	−.09*	−.23***	−.03	.11*	−.04	.13**	–					
18. Anxiety symptoms	−.10*	−.13**	.07	.14**	−.01	.17***	.55***	–				
19. Conduct Disorder symptoms	−.16**	−.20***	.00	.01	.19***	.17***	.30***	.19***	–			
20. Communication	.15**	.65***	−.08	.15**	−.15**	−.15**	−.18***	−.14**	−.21***	–		
21. Trust	.20***	.65***	−.16**	.04	−.17***	−.21***	−.23***	−.19***	−.22***	.79***	–	
22. Alienation	−.21***	−.47***	.06	.09	.16***	.24***	.36***	.31***	.29***	−.60***	−.60***	–

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

[a] 1 = no school, 2 = elementary school, 3 = some high school, 4 = high school graduate, 5 = some college or vocational school, 6 = college graduate

[b] 1 = ≤ $5,000, 2 = $5,001 to $10,000, 3 = $10,001 to $15,000, 4 = $15,001 to $20,000, 5 = $20,001 to $25,000, 6 = $25,001 to $30,000, 7 = $30,001 to $35,000, 8 = $35,001 to $40,000, 9 = $40,001 to $50,000, 10 = $50,001 to $75,000, 11 = $75,001 and above

Table 5 Results from regression analyses predicting adolescent mental health symptoms and parent-adolescent relationship quality from the affection discordance groups

	Adolescent mental health symptoms									Parent-adolescent relationship quality								
	Depression			Anxiety			Conduct disorder			Communication			Trust			Alienation		
	B	SE	β	B	SE	β	B	SE	β	B	SE	β	B	SE	β	B	SE	β
Age	.10	.12	.08	−.13	.07	−.10	.22	.11	.10	.02	.02	.04	.01	.02	.03	−.01	.02	−.03
Adolescent gender	1.52	.43	.18***	1.00	.23	.21***	−2.21	.37	−.27***	.06	.06	.04	−.08	.05	−.06	.05	.07	.03
Parent gender	.12	.09	.07	.00	.05	.00	.08	.08	.05	.01	.01	.02	.01	.01	.02	.01	.02	.02
African-American	−.03	.49	.00	.11	.27	.02	.23	.42	.03	.03	.07	.02	−.01	.06	−.01	.06	.08	.04
European-American	.45	.71	.04	−.08	.39	−.01	1.04	.61	.09	.15	.10	.07	.16	.09	.08	−.05	.11	−.02
Other ethnicity	−.51	1.08	−.02	−.04	.59	.00	−1.63	.93	−.08	−.23	.14	−.06	−.02	.14	−.01	.06	.17	.01
Parents' level of education	−.23	.19	−.07	−.01	.10	−.01	.02	.16	.01	−.01	.03	−.01	.03	.02	.05	−.08	.03	−.13
Income	.14	.08	.09	−.08	.05	−.10	−.17	.07	−.13	.00	.01	.02	.00	.01	−.01	.01	.01	.05
Intervention	.07	.09	.04	.03	.05	.03	.08	.07	.05	.00	.01	.02	−.01	.01	−.03	.01	.01	.05
Parent self-report of affection	.82	.72	.08	.15	.39	.03	.08	.62	.01	−.04	.10	−.02	.02	.09	.01	−.04	.12	−.02
Adolescent rating of parent's affection	−1.90	.53	−.26***	−.49	.29	−.13	−1.42	.46	−.22**	.77	.07	.65***	.73	.07	.64***	−.58	.09	−.46***
Affection discordance patterns																		
Mutually discordant ($n = 60$)	1.58	.86	.12	1.21	.47	.16*	1.97	.74	.16*	−.14	.12	−.06	−.17	.11	−.08	.37	.14	.15*
Parent higher ($n = 214$)	.15	.71	.02	.33	.38	.07	.44	.61	.05	−.06	.10	−.04	−.13	.09	−.09	.07	.11	.04
Adolescent higher ($n = 98$)	1.71	.75	.15	.97	.41	.16	2.02	.65	.20*	−.16	.10	−.09	−.23	.10	−.13	.27	.12	.14
F			3.67***			3.25***			7.51***			21.87***			23.89***			10.46***
R^2			.11			.10			.20			.43			.46			.27

For the affection discordance patterns, the concordant group ($n = 122$) was the comparison group

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

Table 6 Results from regression analyses predicting adolescent mental health symptoms and parent-adolescent relationship quality from the control discordance groups

	Adolescent mental health symptoms									Parent-adolescent relationship quality								
	Depression			Anxiety			Conduct disorder			Communication			Trust			Alienation		
	B	SE	β	B	SE	β	B	SE	β	B	SE	β	B	SE	β	B	SE	β
Age	.21	.13	.08	−.10	.07	−.08	.26	.11	.12	.01	.02	.01	.00	.02	−.01	.00	.02	.00
Adolescent gender	1.35	.43	.15*	.83	.23	.17***	−2.43	.38	−.30***	.03	.07	.02	−.08	.07	−.06	.03	.08	.02
Parent gender	.16	.09	.09	.03	.05	.03	.11	.08	.07	.00	.02	−.01	−.01	.02	−.03	.02	.02	.08
African-American	.14	.50	.02	.20	.27	.04	.53	.44	.06	−.05	.08	−.03	−.11	.08	−.08	.13	.09	.08
European-American	.89	.76	.07	.23	.41	.04	1.61	.67	.14	.06	.13	.03	.00	.12	.00	.08	.14	.03
Other ethnicity	−.40	1.11	−.02	.05	.59	.00	−1.69	.98	−.08	−.22	.19	−.06	−.05	.18	−.01	.05	.20	.01
Parents' level of education	−.19	.20	−.05	.03	.10	.01	.02	.17	.01	.00	.03	−.01	.02	.03	.03	−.07	.04	−.11
Income	.14	.09	.09	−.07	.05	−.09	−.15	.08	−.11	−.01	.02	−.03	−.02	.01	−.08	.02	.02	.09
Intervention	.06	.09	.03	.02	.05	.02	.06	.08	.04	.01	.02	.02	.01	.01	−.02	.01	.02	.03
Parent self-report of control	−.86	.55	−.14	−.58	.29	−.18	.22	.48	.04	−.24	.09	−.24*	−.24	.09	−.26*	.08	.10	.08
Adolescent rating of parent's control	1.53	.55	.21*	1.05	.29	.27***	.35	.48	.05	.27	.09	.23*	.14	.09	.12	.13	.10	.10
Control discordance patterns																		
Mutually discordant ($n = 87$)	.81	.80	.07	.61	.42	.10	.21	.70	.02	−.19	.13	−.09	−.13	.13	−.07	.38	.14	.19*
Parent higher ($n = 163$)	1.40	.79	.15	.86	.42	.17	−.03	.69	.00	.00	.13	.00	.02	.13	.02	.12	.14	.07
Adolescent higher ($n = 168$)	−.12	.81	−.01	−.46	.43	−.09	.00	.71	.00	−.21	.14	−.14	−.09	.13	−.06	.16	.14	.10
F			2.07*			2.82***			4.39***			1.71			1.42			1.49
R^2			.07			.09			.13			.06			.05			.05

For the control discordance patterns, the concordant group ($n = 76$) was the comparison group

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

Table 7 Results from regression analyses predicting adolescent mental health symptoms and parent-adolescent relationship quality from the punitiveness discordance groups

	Adolescent mental health symptoms									Parent-adolescent relationship quality								
	Depression			Anxiety			Conduct disorder			Communication			Trust			Alienation		
	B	SE	β	B	SE	β	B	SE	β	B	SE	β	B	SE	β	B	SE	β
Age	.25	.13	.10	−.09	.07	−.07	.23	.11	.15*	.00	.02	.00	−.01	.02	−.02	.01	.02	.03
Adolescent gender	1.53	.43	.17***	.95	.23	.23***	−2.21	.37	−.27***	.03	.07	.02	−.11	.07	−.08	.07	.08	.04
Parent gender	.12	.09	.07	.00	.05	.00	.08	.08	.05	−.01	.02	−.02	−.01	.02	−.02	.02	.02	.06
African-American	.30	.50	.03	.26	.27	.05	.25	.43	.03	−.01	.09	−.01	−.05	.08	−.04	.11	.09	.07
European-American	1.00	.73	.08	.25	.39	.04	1.51	.63	.13	.04	.12	.02	.05	.12	.03	.09	.13	.04
Other ethnicity	−.41	1.11	−.02	.02	.59	.00	−1.40	.95	−.07	−.30	.19	−.08	−.10	.18	−.03	.11	.19	.03
Parents' level of education	−.27	.19	−.08	−.03	.10	−.02	.05	.17	.02	−.02	.03	−.03	.02	.03	.03	−.07	.03	−.12
Income	.15	.09	.10	−.07	.05	−.09	−.16	.07	−.12	.00	.01	−.01	−.01	.01	−.04	.02	.02	.08
Intervention	.05	.09	.03	.01	.05	.01	.05	.08	.03	.01	.01	.04	.00	.01	.00	.00	.02	.01
Parent self-report of punitiveness	−.27	.53	−.05	−.12	.28	−.04	.40	.46	.07	−.15	.09	−.15	−.11	.09	−.11	.09	.09	.09
Adolescent rating of parent's punitiveness	1.19	.55	.16	.62	.30	.16	1.22	.48	.18	−.11	.09	−.09	−.22	.09	−.19	.28	.10	.22*
Punitiveness discordance patterns																		
Mutually discordant ($n = 74$)	−.29	.85	−.02	.12	.45	.02	−.35	.73	−.03	−.21	.14	−.10	−.12	.14	−.06	.20	.15	.09
Parent higher ($n = 194$)	.05	.84	.00	.34	.45	.07	.07	.72	.01	−.02	.14	−.01	.00	.14	.00	.00	.15	.00
Adolescent higher ($n = 166$)	.37	.83	.04	.55	.44	.11	−.76	.72	−.09	−.08	.14	−.05	.04	.13	.02	−.03	.15	−.02
F			2.47**			2.99***			5.99***			1.63			2.25*			3.01***
R^2			.08			.09			.17			.05			.07			.10

For the punitiveness discordance patterns, the concordant group ($n = 60$) was the comparison group

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

three aspects of parenting. This hypothesis received support, primarily for discordance in ratings of parent affection. With regard to ratings of affection, adolescents in dyads with the *mutual discordance* pattern reported more anxiety and conduct disorder compared with adolescents in dyads with the *concordance* pattern (both βs = .16, $p < .05$) and more alienation from their parents ($\beta = .15$, $p < .05$). With regard to ratings of parental control, adolescents in dyads with the *mutual discordance* pattern reported more alienation from their parents ($\beta = .19$, $p < .05$). No other associations were found for the mutual discordance pattern for control and none were found for the mutual discordance pattern for punitiveness.

In Hypothesis 3, we proposed that adolescents in the adolescent higher discordance group for affection would report fewer mental health problems and higher quality relationships with their parents. As seen in Table 5, while all associations were in the predicted direction, only the association for conduct disorder symptoms was significant ($\beta = .20$, $p < .05$). Thus, Hypothesis 3 received limited support.

Finally, for Hypothesis 4 we predicted that adolescents in dyads characterized by the adolescent higher pattern for parental control and parental punitiveness would report more mental health problems and lower quality relationships with their parents. None of these coefficients was significant, leading us to reject Hypothesis 4.

Discussion

The prevalence of discordance between informants' ratings of psychological and developmental phenomena has prompted concern over how best to understand and contend with informant discrepancies (De Los Reyes 2011).Traditionally, discordance between parent and child ratings of child mental health symptoms or of parents' behaviors has been treated as a problem of reliability or methodological error that needs to be corrected for. However, more recent research (e.g. De Los Reyes et al. 2010; Renk et al. 2008) has strived to better understand the meaning of and individual characteristics related to discordance and determine whether the study of discordance may provide important information about child and adolescent psychopathology. Indeed, the majority of work concerning discordance has focused on discrepancies in ratings of children's internalizing and externalizing behaviors (e.g., Ehrlich et al. 2011; Renk et al. 2008; for a review see Achenbach et al. 1987). Fewer studies have examined discordance between parents and children in their ratings of parenting. This study examined whether discordance in parents' and adolescents' ratings of parenting practices was related to adolescent mental health and parent–adolescent relationship quality in order to better understand the extent to which discordance may serve as an indicator of the quality of the parent–adolescent interactions.

In contrast to previous studies of discordance, we examined discordance between parent and adolescent ratings of three sets of parenting behaviors derived at the item-level and grouped into patterns that preserved both the magnitude and the direction of the discordance. We found that by grouping parent–adolescent dyads into discordance patterns using difference scores at the item-level, we were able to identify a *mutually discordant* pattern of parent–adolescent ratings of parenting that would not have been captured had discordance patterns been calculated at the scale-level. Similar to other methods of calculating discordance, we were also able to identify *adolescent higher, parent higher* and *concordant* patterns of parent–adolescent ratings of parenting. We determined that a substantial number of dyads fell into each of the four discordance patterns for affection, control, and punitiveness. Across all measure of parenting (affection, control and punitiveness), this *mutually discordant* pattern was present in between twelve and eighteen percent of all parent–adolescent dyads, thus accounting for a significant proportion of the overall study population. The *parent higher* pattern was most common for affection, which indicates a tendency for parents to rate themselves more affectionate than do their adolescents. Given that affection is a desirable parenting trait, it makes sense that parents would perceive themselves as higher in this positive parenting behavior. The *concordance* pattern was also highest for affection, suggesting that it may be easier for parents and adolescents to agree about the level of affection in their relationship compared to control and punitiveness. Indeed, for control and punitiveness, the *parent higher* and *adolescent higher* patterns were more common compared to the *mutually discordant* and *concordant* patterns.

With respect to main effects and consistent with prior studies (Bruce et al. 2006; Pelton and Forehand 2001; Renk et al. 2008), adolescent mental health symptoms and adolescent–parent relationship quality were predicted by both parent and adolescent ratings of parenting, although much more so by the latter. Adolescents' ratings of their parents' affection were significantly associated with five of the six outcomes, namely with lower depression and conduct disorder symptoms, more communication and trust, and less alienation. Adolescents' ratings of parents' control were associated with higher adolescent ratings of their depression and anxiety symptoms in addition to communication in their relationships with their parents. Adolescents' ratings of their parents' punitiveness were associated with greater alienation in the parent–adolescent relationship. In contrast, parents' self-reports of their affection and punitiveness toward their adolescents were not associated with

any outcomes, while their reports of their control were associated with less communication and less trust.

By and large, how parents viewed their own parenting was not associated with the adolescents' reports of mental health symptoms or of their relationships with their parents. In contrast, adolescents' reports of their parents' affection and (to a lesser extent) control and punitiveness were associated with their mental health and with adolescent–parent relationship quality. These results suggest that adolescents' perceptions of how their parents behave toward them is more predictive of mental health and relationship outcomes than parents' self-reports of their own behavior. From our perspective articulated at the outset, we do not consider one rater to be a more "accurate" reporter of parent behavior but rather privilege the role of perceptions. While we cannot rule out the possibility that shared method variance between the adolescents' ratings of parenting and of adolescents' ratings of the outcomes accounts for some of the significant associations, we argue that adolescents' ratings of parenting should be more strongly related to mental health and his or her view of the parent–adolescent relationship. If an adolescent perceives his parent to be punitive even if the parent does not view herself as punitive, it is the adolescent's perception that will drive the development of mental health problems or of problems in his relationships with his parents.

Consistent with our hypotheses, we demonstrated that the *mutually discordant* pattern of discordance in particular is successful in predicting adolescent mental health symptoms and adolescents' ratings of the quality of their relationships with their parents, over and above the main effects of parents' and adolescents' ratings of parenting behaviors. This *mutually discordant* pattern may be indicative of inconsistent affection perhaps resulting from parent–child conflict or (as the results also suggest) alienation in the parent–child relationship. These results indicate that over and above the association of parenting practices with mental health and parent–adolescent relationship quality, adolescents in parent–adolescent dyads with a high level of disagreement about parenting practices may be particularly at-risk for poor developmental outcomes. These findings are consistent with previous work (e.g., De Los Reyes et al. 2010) finding that "informant discrepancies predict poor outcomes in ways that cannot be accounted for by the individual reports" (De Los Reyes 2011, p. 4). Thus, not only does examination of discordance provide another marker of the parent–adolescent relationship that may influence mental health outcomes, but it also provides information as to how the parent–adolescent relationship may either foster or mitigate discordance in parent–adolescent ratings of developmental phenomena overall that otherwise may have been missed had discordance not been examined.

It is important to bear in mind that the findings for these discordance patterns are over and above the main effects of parent and adolescent reports of affection suggesting that it is the pattern of discordance itself, not parenting per se, that is associated with more negative outcomes. Future research should explore the relationship of discordance patterns to further adolescent outcomes in addition to patterns of discordance in other developmental phenomena in order to replicate and further the finding observed in this study. If substantiated and explicated in longitudinal research and in-depth interviews, these findings may have clinical and/or preventive implications for identifying and mediating parent–child conflict.

The discordance patterns for control and punitiveness were less predictive of adolescent mental health problems and of adolescent–parent relationship quality than were the affection discordance patterns. Perhaps the relatively lower reliability of adolescent ratings of parental control and punitiveness accounts for this (see below). It may also be that disagreements about how much control parents have over their adolescents' lives and about how punitively they respond to misbehaviors are normative as adolescents test boundaries, but that disagreements in affection point to deeper disturbances in the parent–adolescent relationship. Future studies that ask both adolescents and parents to describe their ratings in more depth could help illuminate the processes by which discordance affects mental health.

Although the *parent higher* pattern was most common for ratings of affection and punitiveness and equally common compared to the *adolescent higher* pattern for ratings of control, when we turned to using these patterns to predict adolescent mental health and adolescent–parent relationship quality, we found that the *parent higher* pattern for affection did not predict any outcomes, nor did the *parent higher* pattern for control or punitiveness. Given that the *parent higher* pattern was most common, it may be that parents rating themselves more favorably than do their adolescents is not a symptom of a problematic adolescent–parent relationship but rather is evidence of self-serving bias (Campbell and Sedikides 1999).

As with all research studies, this study is not without limitations. As indicated previously, the reliability of the adolescent reports of control and punitiveness were low. The standard deviations for these subscales were quite similar to that for the affection subscale that had high reliability (punitiveness $mean = 2.28$, $SD = 0.60$, and control $mean = 2.85$, $SD = 0.61$ vs. affection $mean = 3.35$, $SD = 0.61$), indicating that the differences in alphas were not a result of restriction of range. It is possible that the low reliabilities for adolescent reports of these parenting practices may have impacted construction of the discordance patterns for control and punitiveness and contributed to fewer significant findings compared to the

affection discordance patterns. A second limitation is that the low number of fathers in the study hinders the ability to assess whether father–adolescent discordance patterns were differentially associated with adolescent outcomes than mother–adolescent discordance patterns. Although we controlled for both parent and adolescent gender, it is possible that differences could be found between mothers and fathers with a sample that included a larger number of fathers. Lastly, because this study is cross-sectional, the directionality of relationships could not be established. Therefore, it is possible that mental health symptoms or parent–adolescent relationship quality may impact the degree to which parents and adolescents provide similar reports of parenting practices. Irrespective of the direction of the relationship, however, parent–adolescent discordance remains an important phenomenon with significant implications for developmental research.

Overall, our results suggest that, over and above the main effects of parent and adolescent ratings of parenting, discordance patterns determined through item-level disagreements were indeed associated with adolescent mental health problems and poor adolescent–parent relationship quality when compared with concordance in parenting ratings. Patterns of discordance were most important for ratings of affection, suggesting that the extent to which parents and adolescents disagree on the levels of affection displayed by parents is a key marker of adolescents' mental health and the quality of relationships with their parents. Yet, discordance of any form is indicative of a clash between what adolescents say they receive from their parents and what parents say they provide. It is clear that when parents and adolescents have highly discordant views on how affectionate parents are, adolescents are more likely to suffer mental health symptoms.

Unlike many studies of discordance that are concerned with the implications of inter-rater reliablity for clinical assessment, and in keeping with the more recent trend to understand the meaning of discordance, this study has demonstrated that discordance between parent and adolescents is an important phenomenon in its own right. Particularly, grouping dyads into patterns of discordance from item-level differences in ratings of affection has proved to be a fruitful way of identifying problematic parent–adolescent relationships. We recommend that other researchers interested in such relationships consider discordance as a marker of relationship quality in and of itself rather than just as a problem of low reliability. Discordance is in fact a meaningful distance between two equally valid perceptions and thus can be an informative indicator of the relationships between parents and adolescents.

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