

# Discrepancies Between Parent and Adolescent Beliefs About Daily Life Topics and Performance on an Emotion Recognition Task

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**Abstract** Parents and children and adolescents commonly disagree in their perceptions of a variety of behaviors, including the family relationship and environment, and child and adolescent psychopathology. To this end, numerous studies have examined to what extent increased discrepant perceptions—particularly with regard to perceptions of the family relationship and environment—predict increased child and adolescent psychopathology. Parents’ and children and adolescents’ abilities to decode and identify others’ emotions (i.e., emotion recognition) may play a role in the link between discrepant perceptions and child and adolescent psychopathology. We examined parents’ and adolescents’ emotion recognition abilities in relation to discrepancies between parent and adolescent perceptions of daily life topics. In a sample of 50 parents and adolescents ages 14-to-17 years ( $M=15.4$  years, 20 males, 54 % African-American), parents and adolescents were each administered a widely used performance-based measure of emotion recognition. Parents and adolescents were also administered a structured interview designed to directly assess each of their perceptions of the extent to which discrepancies existed in their beliefs about daily life topics (e.g., whether adolescents should complete their homework and carry out household chores). Interestingly, lower parent and adolescent emotion recognition performance significantly related to greater parent and adolescent perceived discrepant beliefs about daily life topics. We observed this relation whilst accounting

for adolescent age and gender and levels of parent-adolescent conflict. These findings have important implications for understanding and using informant discrepancies in both basic developmental psychopathology research and applied research in clinic settings (e.g., discrepant views on therapeutic goals).

**Keywords** Emotion recognition · Informant disagreement · Informant discrepancies · Multiple informants · Reading the Mind in the Eyes Test · To(may)to-To(mah)to Interview

One of the most robust findings in developmental psychopathology research is that multiple informants’ reports of child and adolescent (i.e., hereafter collectively referred to as “children” unless otherwise specified), and family behavior commonly disagree (for a review see Achenbach 2006). The informants for whom discrepant behavioral reports commonly arise vary widely and typically consist of people with whom children spend a significant amount of time (e.g., parents, teachers, and peers; De Los Reyes 2011). These informants’ reports often yield distinct outcomes relative to reports taken from trained judges of child and family behavior (e.g., behavioral coders, interviewers, and therapists), and official records (e.g., grades and standardized test scores; De Los Reyes 2013). Informant discrepancies commonly arise between reports of both domains of child behavior (e.g., aggression; anxiety; attention and hyperactivity; and depressed mood; for a review see De Los Reyes and Kazdin 2005), and environmental factors that can influence child behavior (e.g., community crime and violence and parenting behaviors; for reviews see Goodman et al. 2010; Taber 2010).

In light of the common occurrence of informant discrepancies, it should not be surprising that these discrepancies significantly impact developmental psychopathology research. For instance, informant discrepancies routinely arise

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in behavior genetics and prospective longitudinal studies (e.g., for reviews see Achenbach 2011; Dirks et al. 2012). Additionally, multiple informants' outcome reports often wholly comprise evidence supporting the efficacy of children's psychological interventions (for a review see Weisz et al. 2005). In fact, researchers frequently observe different findings in the outcomes of controlled trials testing psychological interventions, depending on the informant (e.g., for reviews see Casey and Berman 1985; De Los Reyes and Kazdin 2009).

Importantly, one cannot resolve the interpretative issues raised by informant discrepancies by simply replacing use of multiple informants' reports with a single measure of the behavior being assessed (De Los Reyes et al. 2011b). This is because a single measure, by construction, often has to be completed by a single informant or judge trained to complete the measure (e.g., trained interviewer or rater), and recent work indicates that these trained judges do not systematically incorporate information from all informants' reports available to them (e.g., De Los Reyes et al. 2011a, c; Hawley and Weisz 2003). In sum, informant discrepancies greatly impact the interpretation of research findings in developmental psychopathology research. Thus, researchers should seek to understand why informant discrepancies exist, as well as the implications these discrepancies may have for the development of child psychopathology.

Two recent lines of research deal with increasing understanding of informant discrepancies and how to interpret them. The first is informed by theoretical work indicating that informant discrepancies may be explained, in part, by variations among informants in their perspectives on the behaviors being assessed (e.g., self- vs. other-perspective) and the settings within which they observe these behaviors (e.g., home vs. school settings; De Los Reyes et al. 2013d; Kraemer et al. 2003). In support of this theoretical work, studies of participants ranging from preschool to adulthood have demonstrated that greater informant discrepancies relate to increased variation in the contexts within which participants express the behaviors being assessed (De Los Reyes et al. 2009, 2013a; Hartley et al. 2011). Further, experimental work indicates that trained judges of children's behavior (i.e., clinicians) attend to contextual information (e.g., environmental risk factors of childhood psychopathology) when providing reports about such behavior (De Los Reyes and Marsh 2011). Additional experimental work indicates that parents and adolescents can be trained to incorporate information about the contexts within which specific behaviors occur when providing reports about these behaviors (De Los Reyes et al. 2013b). A key implication of this work is that if variations among informants' perspectives and the contexts within which they observe behavior explain significant portions of discrepancies, then informants' reports may disagree, and yet each report may still validly

represent the behaviors being assessed (see De Los Reyes et al. 2012a; Hay et al. 1999).

A second line of research stems from the idea that if informants hold discrepant perceptions about behaviors present in their daily lives (e.g., family conflict and parenting behaviors), then these discrepant perceptions may have significant implications for how informants interact with each other, and how children develop (see De Los Reyes and Kazdin 2006; Ferdinand et al. 2004). Specifically, studies have found that increased discrepancies between parent and child reports on salient and ubiquitous behaviors present in the family environment (e.g., driving restrictions, parent-child relationship quality, parenting practices, and parental monitoring of children's whereabouts and activities) longitudinally predict increased child psychopathology (for a review see De Los Reyes 2011). However, to our knowledge, no previous empirical work has focused on seeking to understand how these relations originate.

Interestingly, recent theoretical work has sought to delineate potential precursors of the links between parent-child discrepancies in reports about the family environment and child psychopathology outcomes. Specifically, the Discrepancies in Victimization Implicate Developmental Effects (DiVIDE) Model posits that underlying parent-child reporting discrepancies is a lack of understanding in the family relationship (Goodman et al. 2010). In the DiVIDE Model, this lack of understanding is thought to predispose a child to developing psychopathological outcomes. Though focusing on reports of children's victimization, the DiVIDE Model may be of use in understanding the links between informant discrepancies on reports of other kinds of child and family behavior and child psychopathology outcomes. As preliminary evidence of this, consider a recent study that found congruent parent-child perceptions of family acceptance longitudinally predicted decreased child depressive symptoms (Laird and De Los Reyes 2013).

In line with the DiVIDE Model and recent empirical work, it is important to examine parent and child characteristics that may serve as *reflections* of poor family understanding. One such characteristic may be expressions of *poor emotion recognition* among parents and children, or their abilities to identify the emotions of others (e.g., Baron-Cohen et al. 2001). Lower levels of emotion recognition relate to higher levels of difficulties with social interactions (Baron-Cohen et al. 2001), and mediate the capacity to display situation-appropriate facial expressions (Likowski et al. 2011). In fact, among patients demonstrating normative levels of intelligence, greater self-reported symptoms of autism relate to decreased emotion recognition (e.g., Baron-Cohen et al. 2001). In another study, greater parent-reported conduct problems related to lower child emotion recognition (Sharp 2008). Thus, lower levels of emotion recognition relate to greater expressions of psychopathology.

Presumably, poor emotion recognition in parents and children may be a marker for high levels of parent–child discrepancies. This is because high levels of emotion recognition may be necessary to achieve consonance in understanding and expectations in parent–child dynamics (especially among adolescents). In line with this, parents and children who demonstrate high levels of emotion recognition may evidence low levels of discrepant perceptions, and parents and children who demonstrate low levels of emotion recognition may evidence higher levels of discrepant perceptions. Therefore, one way to test components of the DiVIDE Model is to examine parents' and children's levels of emotion recognition in relation to discrepancies between their views on the same behaviors.

## Purpose

The purpose of this study was to extend the literature on informant discrepancies in developmental psychopathology research. We advanced the literature in two ways. First, we took advantage of recent psychometric research on structured interviews that directly assess the extent to which parents and children perceive daily life topics differently (e.g., doing chores and homework; De Los Reyes et al. 2012b). Assessing discrepant perceptions of daily life topics is consistent with work reviewed previously indicating that frequently occurring and normative aspects of the family environment are the constructs for which discrepant perceptions show particular promise in terms of predicting child psychopathology outcomes (De Los Reyes 2011; Laird and De Los Reyes 2013). Further, recent work supports the criterion-related validity of these structured interviews of discrepant perceptions of daily life topics, and this research was carried out by studying these discrepant perceptions in relation to discrepant reports of normative family behaviors (i.e., parental monitoring; see De Los Reyes et al. 2013c). Using these innovative interview methods for assessing discrepant perceptions, we sought to address recent work indicating that commonly used measures of informant discrepancies (e.g., difference scores calculated between two informants' reports) may inadequately represent the construct (see De Los Reyes and Kazdin 2004; Laird and De Los Reyes 2013; Laird and Weems 2011). Importantly, direct assessments of discrepant views relate to recently recommended measures of informant discrepancies (De Los Reyes et al. 2013c), namely indirect measures of discrepancies that consist of statistical interactions calculated between informants' parallel behavioral reports (Laird and Weems 2011). Thus, both direct and indirect measures of informant discrepancies, though assessing discrepancies using disparate methods, appear to reflect the same construct (i.e., the extent to which two informants perceive the same behavior differently). Yet, the measurement of perceived/directly assessed discrepancies may

better lend itself to the assessment of precursors of discrepancies than indirect assessments such as statistical interactions. That is, relative to statistical interactions, perceived discrepancies (a) may be more parsimonious in their interpretation (i.e., they do not rely on measurements of distinct constructs [e.g., parental monitoring] to arrive at estimates of discrepant views), and similarly, (b) allow for within-person examinations of social-cognitive factors (e.g., emotion recognition) in relation to within-person discrepant views. Therefore, on conceptual grounds, direct assessments of discrepant views better lend themselves to theory testing and model interpretation than statistical interactions. Further, relative to statistical interactions, direct assessments provide quantitative benefits, most notably increased statistical power to detect hypothesized effects (see also Cohen et al. 2003). Thus, we relied on direct assessments to assess discrepant perceptions.

A second advancement our study makes to the literature stems from the fact that prior work on the associative characteristics of discrepancies has largely relied on assessing these characteristics via subjective self-reports or clinical interviews based on patients' reports (see De Los Reyes and Kazdin 2005). This creates the potential for observed relations to be confounded by informants providing reports used to assess both informant discrepancies and associative characteristics (see also De Los Reyes et al. 2008, 2010). Therefore, our assessments of informants' levels of emotion recognition consisted of performance-based measures of informants' emotion recognition (Baron-Cohen et al. 2001).

## Hypothesis

In a community sample of parents and adolescents, we examined parents' and adolescents' abilities to understand the emotions of others (i.e., emotion recognition), in relation to parent and adolescent perceptions of the extent to which they each view daily life topics differently. We chose to focus on parents and adolescents, because much of the empirical work on the links between informant discrepancies and psychopathology has focused on the development of adolescent psychopathology (e.g., Ferdinand et al. 2004; Guion et al. 2009; Laird and De Los Reyes 2013; Pelton and Forehand 2001).

Consistent with recent theoretical work on the links between parent–child reporting discrepancies and child psychopathology (Goodman et al. 2010), we expected to find that decreased parent and adolescent performance on an objective measure of emotion recognition would be related to increased levels of parent- and adolescent-reported discrepancies in how they perceived daily life topics. Additionally, parent-adolescent discrepancies in behavioral reports often relate to both adolescent demographics (e.g., adolescent age and gender; see De Los Reyes and Kazdin 2005), and parent-adolescent conflict (e.g., De Los Reyes

and Kazdin 2006; De Los Reyes et al. 2012b; Treutler and Epkins 2003). Thus, we statistically controlled for both adolescent demographics and parent-adolescent conflict in the main test of our hypothesis.

## Method

### Participants

Data reported below are based on information collected from families who participated in a larger psychometric study of measures of parent–child conflict (De Los Reyes et al. 2012b). Specifically, in De Los Reyes et al. (2012b), the authors sought to validate the structured interview of parent–child conflict and discrepant beliefs described below. Needless to say, a prerequisite to conducting the present study was ensuring that all measures used in the study were validated and psychometrically sound measures. Importantly, the performance-based measure of emotion recognition used in the present study was not examined in De Los Reyes et al. (2012b). Thus, the hypotheses tested in this study and the data reported below are unique to this study and have not been previously reported.

From the larger De Los Reyes et al. (2012b) study, we examined a sub-sample of 50 families who were recruited because they spoke English, had an adolescent in the home between the ages of 14 and 17 years, and completed information on all constructs. The sample for this study included families with an adolescent aged 14 to 17 years (20 males and 30 females;  $M=15.4$  years;  $SD=1.1$  years) who lived in a large metropolitan area in the Mid-Atlantic United States. The parent identified the child's race as White, Caucasian American, or European ( $n=18$ ), African American or Black ( $n=27$ ), or some other race ( $n=5$ ). Parents had a mean age of 46.6 years ( $SD=6.8$  years, range of 31–64 years; 3 parents did not provide proper age data). Parents identified themselves primarily as biological (92 %; 3 biological fathers and 43 biological mothers), with a minority identifying as grandmother (4 %), legal guardian (i.e., child's aunt;  $n=1$ ), or stepmother ( $n=1$ ). For the purposes of this paper and consistent with prior work (De Los Reyes et al. 2008, 2010, 2011c, 2012b), we collectively refer to these caregivers as “parents.” Families provided reports of their weekly household income, consistent with prior work (De Los Reyes et al. 2008, 2010, 2012a, b, 2013b). In our sample, 18.4 % of the families had a weekly household income of \$600 or less; 59.2 % earned greater than \$900 per week (1 family did not provide income data). The economic and racial background figures for our sample are in keeping with the

economic and racial background representation of the geographic area of our sampling range (U.S. Census Bureau 2010). All participants were monetarily compensated for their participation and debriefed as to study procedures and aims at the completion of the study.

### Procedure

All procedures were approved by the Internal Review Board of the large Mid-Atlantic university in which we conducted the study. We recruited participants from a large metropolitan area in the Mid-Atlantic United States through community agencies, events, and via advertisements posted online (e.g., Craigslist) in qualifying neighborhoods (i.e., neighborhoods targeted because of demographic variability). Families provided informed consent and assent. Two research assistants (i.e., undergraduate or post-baccalaureate trainees) then administered the interviews and performance-based tasks described below to the parent and adolescent in separate rooms and in counterbalanced order. Following these interviews and tasks, the parent and adolescent completed a counterbalanced battery of measures, which included parent and adolescent questionnaire survey reports of various aspects of parent-adolescent relationships and psychological functioning (none of these survey data are reported in this paper).

We administered all assessments reported in this study on a computer in which the interviewer directly inputted responses to items. Responses were recorded using IBM SPSS Data Collection survey administration software (Version 5.6; IBM Corporation 2009). Research assistants practiced administering the interview and performance-based measures to each other approximately 4–6 times and videotaped these practices to be observed by the first author at weekly supervision meetings. At these meetings, the first author reviewed practice assessments to determine interviewers' readiness to administer the interview. In addition, we periodically implemented continued reviews of videotaped administrations of the assessments to actual participants to ensure that our research assistants continued to administer the interview as trained. All assessment administrators were kept blind to study hypotheses.

### Measures

**Demographics** Parents completed a parent, adolescent and family demographics form.

**Structured Interview of Behavioral Conflict and Discrepant Beliefs** The To(may)to-To(mah)to Interview (TTI; De Los Reyes and Suarez 2009; De Los Reyes et al. 2012b) is

a structured interview and includes both parent and child/adolescent versions. We administered the TTI independently to parents and adolescents, with a duration of approximately 30–45 min. The TTI assesses informants' perceptions about 16 daily life topics derived from research in the developmental literature on topics of parent-adolescent disagreement (e.g., the adolescent's computer time, spending time with the family, quality of grades; Darling et al. 2006). The TTI contains two key sections in which we administered items based on the same 16 daily life topics (i.e., topic content held constant across sections). First, respondents provided reports about perceived *behavioral conflict* between parents and adolescents (hereafter referred to as TTI-Behavioral Conflict; sample parent report item: "How often do you argue or fight with your teen about your teen doing his/her chores?"). Second, respondents provided reports about perceived *differences* between the *beliefs* parents and adolescents have about topics (hereafter referred to as TTI-Discrepant Beliefs; sample parent report item: "Do you think that you and your teen have different beliefs about how often teens his/her age should do their chores?"). For both interview sections, informants provided responses to items on scales of 0 (value labels represent the quantity *None*), 1 (value labels represent the quantity *Some*), and 2 (value labels represent the quantity *A lot*). We calculated total summary scores of the 16 topics in the TTI-Behavioral Conflict and TTI-Discrepant Beliefs sections; scores within each section can range from 0 to 32. The TTI-Behavioral Conflict and TTI-Discrepant Beliefs sections were designed to assess related yet distinct constructs (De Los Reyes et al. 2012b). Therefore, in analyses reported below, we examined scores from these two sections as separate variables.

Importantly, both parents and adolescents provide internally consistent reports on the interview, and both parent and adolescent reports on the TTI-Behavioral Conflict and TTI-Discrepant Beliefs sections evidence convergent and incremental validity (De Los Reyes et al. 2012b), relative to widely used questionnaire measures of parent-adolescent conflict (i.e., Issues Checklist; Prinz et al. 1979). In the current sample, internal consistency alpha estimates for the parent and adolescent TTI-Behavioral Conflict and TTI-Discrepant Beliefs reports ranged from 0.77 to 0.84.

*Performance-Based Measure of Emotion Recognition* Both parents and adolescents were administered the revised version of the Reading the Mind in the Eyes Task (RMET; Baron-Cohen et al. 2001). The RMET is a widely used performance-based measure designed to assess individual differences in general understanding of others' perspectives, yet has demonstrated its clearest, most precise construct validity as a measure of emotion recognition (see Hefter et

al. 2005; Likowski et al. 2011). We assessed emotion recognition using the RMET, in light of work indicating its utility in assessing this construct in both clinic and community based settings and various developmental periods. Specifically, RMET scores reliably distinguish patients experiencing conditions typified by social cognitive impairments (e.g., autism spectrum disorders) or internalizing symptoms (e.g. depressed mood), from samples of healthy community control participants, and relate with continuous measures of such symptoms (e.g., Baron-Cohen et al. 2001; Harkness et al. 2011). Further, the RMET has been successfully administered to measure emotion recognition in community samples of parents and children (Ragsdale and Foley 2011; Sabbagh and Seamans 2008). Thus, use of the RMET allowed us to assess emotion recognition using a measure that appears to robustly tap emotion recognition abilities across clinic and community based samples and developmental periods.

On the RMET, parents and adolescents were individually administered a series of 36 photographs of the eye regions of individuals' faces. After briefly viewing a photograph, participants were prompted to choose which among four words best describes what the person in the photograph was feeling or thinking. Each set of words contains a single correct response; total scores can range from 0 to 36 correct responses. Therefore, an RMET total score represents a performance-based estimate of a participant's emotion recognition ability, with higher total scores indicating higher levels of emotion recognition.

#### Data-Analytic Plan

We first conducted preliminary analyses to detect deviations from normality, and judged whether extreme skewness and/or kurtosis precluded executing parametric analyses (see Tabachnick and Fidell 2001). We also computed bivariate cross-informant correlations between parallel measures. Tests of our main hypothesis involved examining multiple informants' (parent and adolescent) parallel reports of discrepant beliefs about daily life topics as well as their performance on parallel versions of the RMET. It would be difficult to assume these measures to be independent observations. Indeed, informants' reports, although often in disagreement, still significantly correlate in the low-to-moderate range (see De Los Reyes and Kazdin 2005). Thus, our correlated data structure violated key assumptions underlying general linear modeling (GLM) of data. Due to this, we tested our main hypothesis using generalized estimating equations (GEE): an extension of the GLM that assumes correlated observations of dependent and/or independent variables (Hanley et al. 2003).

For GEE modeling, we used an identity link function with an unstructured correlation matrix. We used an unstructured correlation matrix in light of the small number of dependent variables and the fact that we had complete data on all constructs for the 50 families we examined. Specifically, we statistically modeled TTI-Discrepant Beliefs scores as a nested, repeated-measures (within dyadic subjects) dependent variable. We statistically modeled the dependent variable as a function of three sets of factors, and we compared nominal factors (i.e., adolescent gender and informant) in descending order. First, we entered as an independent variable one within-subjects “informant” factor to account for both parent and adolescent providing reports of discrepant beliefs (coded in ascending order of parent and then adolescent). Second, we entered as an independent variable one between-subjects factor of adolescent gender (coded in ascending order of female and then male) and one between-subjects independent covariate of adolescent age. Third, we entered as independent variables two continuous covariates modeled within-informant, similar to the dependent variable: (a) TTI-Behavioral Conflict reports from parent and adolescent and (b) number of correct responses on the RMETs administered to parent and adolescent. As mentioned previously, we controlled for adolescent age and gender, as well as parent-adolescent conflict, because informant discrepancies often relate to these variables (De Los Reyes and Kazdin 2005, 2006; De Los Reyes et al. 2012b; Treutler and Epkins 2003). All continuous independent variables were centered before conducting these analyses.

## Results

### Preliminary Analyses

Frequency distributions for all variables were examined to detect deviations from normality before conducting

primary analyses. We detected no deviations from normality on any variables (i.e., skewness on all variables  $\approx 1.0$ ). In Table 1, we report means and standard deviations of all variables. Further, we report in the Appendix frequencies of reported conflict and discrepant beliefs on the TTI by topic and based on parent and adolescent reports. Prior work indicates that parents and adolescents largely agree that daily life topics (e.g., doing chores and completing homework) are the issues from which conflict interactions typically transpire (Smetana 1989). Additionally, we discussed previously how often parents and adolescents evidence discrepant views on a host of domains of family functioning (De Los Reyes 2013). Consistent with this and with few exceptions, parents and adolescents frequently endorsed behavioral conflict and discrepant beliefs across the range of topics assessed on the TTI.

We also calculated bivariate correlations between all parallel cross-informant reports. Consistent with previous work (De Los Reyes 2011, 2013; De Los Reyes and Kazdin 2005; De Los Reyes et al. 2012b), parent and adolescent reports of behavioral conflict about daily life topics ( $r=0.34$ ,  $p<0.05$ ), as well as their reports of discrepant beliefs about daily life topics ( $r=0.49$ ,  $p<0.001$ ), correlated in the low-to-moderate range (see Cohen 1988). Further, parent and adolescent responses on performance-based measures of emotion recognition exhibited a low non-significant correlation with each other,  $r=0.21$ ,  $p=0.14$ .

### Differences Between Parent and Adolescent Emotion Recognition Performance

In examining the relation between parent and adolescent emotion recognition and parent and adolescent perceptions of discrepant beliefs about daily life topics, it was important to examine whether any relations identified

**Table 1** Means (M) and standard deviations (SD) of measures of parent and adolescent emotion recognition performance and parent and adolescent structured interview reports of parent-adolescent conflict and discrepant beliefs about daily life topics ( $N=50$ )

Variable	Emotion recognition performance		Structured interview: Behavioral Conflict		Structured interview: Discrepant Beliefs	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
RMET						
Parent report	25.16	3.55				
Adolescent report	24.14	4.23				
TTI						
Parent report			8.84	5.04	13.46	6.62
Adolescent report			7.70	4.57	8.70	4.94

RMET Reading the Mind in the Eyes Test; TTI To(may)to-To(mah)to Interview

may be accounted for by differences between parents and adolescents in their levels of emotion recognition. Thus, we conducted paired *t* tests to examine mean differences between the total scores on each of their administrations of the RMET. We observed non-significant differences between mean parent and mean adolescent total scores on the RMET,  $t(49) = 1.46, p = 0.15$ . Importantly, for both parents and adolescents, the mean RMET scores reported in Table 1 are consistent with the mean scores previously reported for healthy community control participants (e.g.,  $M = 26.2, SD = 3.6$ ; Baron-Cohen et al. 2001). Therefore, the findings we report below can neither be explained by parent-adolescent differences in emotion recognition performance nor group-level impairments on the RMET.

Relations Between Parent and Adolescent Perceptions of Discrepant Beliefs About Daily Life Topics and Emotion Recognition Performance

We hypothesized that parent and adolescent emotion recognition performance would negatively relate to parent and adolescent structured interview reports of discrepant beliefs about daily life topics. To test this, we conducted a GEE analysis using the analytic plan that we described previously. We report findings from this GEE analysis in Table 2. We observed a significant main effect for Informant, as well as a significant main effect for TTI-Behavioral Conflict scores. The significant Informant effect indicated that parents reported significantly greater TTI-Discrepant Beliefs scores (Estimated Marginal Mean = 13.44;  $SE = 0.80$ ) relative to adolescents (Estimated Marginal Mean = 8.68;  $SE = 0.57$ ),  $p < 0.001$ . The significant TTI-Behavioral Conflict effect indicated a positive relation between parent- and adolescent-reported behavioral conflict and discrepant beliefs. Consistent with our hypotheses, we observed a

significant negative relation between RMET total scores and TTI-Discrepant Beliefs scores, indicating that as parent and adolescent emotion recognition performance decreased, parent- and adolescent-reported discrepant beliefs about daily life topics increased. To provide an estimate of the magnitude of this relation, we calculated a pseudo- $r^2$  using the Wald  $X^2$  estimates reported in Table 2. Specifically, we divided the Wald estimate for the RMET total scores (i.e., 4.22) by the total of the Wald estimates for each of the independent variables in the model (i.e., total Wald estimates = 70.81). In Table 2, we report pseudo- $r^2$  for the RMET total scores and all other independent variables. The Wald statistic-based pseudo- $r^2$  value for the RMET total scores was over 5 %, further supporting that this relation contributed significant variance to the overall statistical model (see also Engle 1984).

In analyses reported in Table 2, both the TTI-Behavioral Conflict scores and RMET total scores uniquely related to TTI-Discrepant Beliefs scores. These relations make it unclear as to whether parent-adolescent conflict or emotion recognition performance drove the relation with discrepant beliefs. Thus, we conducted a second analysis entering as independent variables the same demographic characteristics and Informant factor reported in Table 2 as well as TTI-Behavioral Conflict scores. However, we entered TTI-Discrepant Beliefs scores as an independent variable and RMET total scores as the dependent variable. In this analysis, the only significant relation was between the TTI-Discrepant Beliefs scores and RMET total scores,  $B = -0.16 (0.07)$ ; 95 % Confidence Interval:  $[-0.31, -0.01]$ ; Wald  $X^2 = 4.64$ ;  $p < 0.05$ . This effect reflected a pseudo- $r^2$  of 59.95 % (i.e., out of a total Wald estimate of 7.74). Importantly, the relation between TTI-Behavioral Conflict scores and RMET total scores was non-significant,  $p = 0.53$ .

**Table 2** Generalized estimating equations predicting discrepant beliefs as a function of adolescent age and gender, informant completing reports of discrepant beliefs, behavioral conflict, and emotion recognition performance ( $N = 50$ )

Factor	Wald $X^2$	Pseudo- $R^2$	B (SE)	95 % CI	<i>p</i>
Adolescent age	2.62	3.70 %	-0.84 (0.52)	[-1.87, 0.18]	0.10
Adolescent gender	0.02	0	-0.16 (1.11)	[-2.34, 2.01]	0.88
Informant	36.10	50.98 %	-4.76 (0.79)	[-6.31, -3.20]	$p < 0.001$
Behavioral conflict	27.85	39.33 %	0.59 (0.11)	[0.37, 0.81]	$p < 0.001$
Emotion recognition performance	4.22	5.96 %	-0.20 (0.10)	[-0.40, -0.01]	$p < 0.05$

*B* Unstandardized beta; *SE* Standard error; 95 % *CI* 95 % Wald confidence interval. Factor contrasts based on comparisons of factors in descending order. The Informant factor (coded in ascending order) was coded Parent and then Adolescent. The Adolescent Gender factor (coded in ascending order) was coded Female and then Male. For statistical tests of main effects, *p* values and 95 % CIs reported reflect significance tests for the reported unstandardized betas

## Discussion

### Main Findings

The purpose of this study was to extend the literature on informant discrepancies in developmental psychopathology research. In a community sample of parents and adolescents, we advanced the literature by incorporating recent work on performance-based assessments of individual differences in emotion recognition (Baron-Cohen et al. 2001), as well as recent psychometric research on parent-adolescent perceptions of how each of them views daily life topics differently (De Los Reyes et al. 2012b, 2013c). In doing so, we attempted to address methodological limitations of previous work in the informant discrepancies literature, most notably measurement of both informant discrepancies and the informant characteristics that may relate to variation in discrepancies.

Consistent with recent theoretical work on the links between parent-child reporting discrepancies and child psychopathology (Goodman et al. 2010), decreased parent and adolescent performance on an objective measure of emotion recognition related to greater levels of parent- and adolescent-reported discrepancies in how they perceived daily life topics. Additionally, these relations were robust to statistically accounting for both adolescent demographics and parent-adolescent conflict, an important observation because parent-child discrepancies in behavioral reports often relate to both child demographic characteristics and parent-child conflict (e.g., De Los Reyes and Kazdin 2005, 2006; De Los Reyes et al. 2012b; Treutler and Epkins 2003).

Importantly, reports of discrepant beliefs and conflict were taken from the same measure (TTI). This likely inflated relations between these reports, relative to observed relations between discrepant beliefs and our methodologically distinct measure of emotion recognition performance (Table 2). In fact, that we controlled for behavioral conflict in our analyses using a measure that shared much method variance with our dependent variable likely made our analyses a conservative test of our main hypothesis. In sum, we made our main findings using tests that were robust to accounting for a number of our study's methodological and sampling features.

### Research and Theoretical Implications

Our findings have important implications for understanding and interpreting informant discrepancies in developmental psychopathology research and practice. First, prior work has documented longitudinal links between increased informant discrepancies in reports about child and family behavior and increased child psychopathology

(De Los Reyes 2011; Laird and De Los Reyes 2013). Yet, we know relatively little about the factors that might precede these links. We were guided by recent theoretical work on family-level precursors of the links between parent-child reporting discrepancies and child psychopathology outcomes (Goodman et al. 2010). In support of previous theoretical work, the present study yielded evidence for candidate informant characteristics (i.e., parent and adolescent abilities to understand and interpret the emotions and thoughts of other people) that can feasibly be implemented in future longitudinal research seeking to test conceptual models of the links between parent-child reporting discrepancies and child psychopathology outcomes. Indeed, recent work suggests that emotion recognition mediates the relationship between a social situation and the appropriate display of emotion in that situation (Likowski et al. 2011). Such displays are likely crucial to achieving consonant understanding between parents and children on important aspects of the parent-child relationship. As a result, we surmised that parents and children who demonstrate low levels of emotion recognition also evidence high levels of discrepant perceptions. These interpretations are supported by the fact that in our study, we identified a negative relation between emotion recognition and perceived parent and adolescent *discrepant beliefs* about daily life topics, whilst statistically accounting for perceived parent and adolescent *behavioral conflict* about these same topics (Table 2). Therefore, our findings reveal a key within-person social cognitive ability that relates to distal between-person (yet within-family) informant discrepancies. We encourage future research to incorporate informants' levels of emotion recognition as key components of predictive models of informant discrepancies in developmental psychopathology research.

Second, our findings also have important implications for future clinical research and practice. Specifically, parents and children commonly disagree on what ought to be the focus or target of therapy for a child's psychological concerns, and researchers have posited that these discrepant perceptions of therapeutic goals may impact the extent to which families become engaged in therapy (Hawley and Weisz 2003). Consistent with these notions, relative to no agreement, parents and children agreeing on at least one treatment goal predicts greater numbers of therapy visits (Brookman-Frazee et al. 2008). Further, agreement (vs. disagreement) between parent-report diagnostic interviews and clinician-generated chart diagnoses predicts fewer no-shows and cancelled appointments as well as a lower likelihood of dropout from therapy (Jensen-Doss and Weisz 2008). Taken together, these findings indicate that discrepant perceptions on the goals of therapy may pose risk for poorer therapeutic engagement. Interestingly, our findings point to new directions that clinicians and researchers may take to address



discrepant perceptions in therapy. That is, perhaps when parents and children disagree on the goals of therapy, clinicians can probe further to see if either parents or children (or both) exhibit deficits in recognizing each other's emotions. If such deficits are apparent, improving these emotion recognition abilities can be viewed as a therapeutic goal in its own right. This is because improvements in these abilities may serve to decrease discrepant perceptions and thus increase a family's therapeutic engagement. Of course, these notions of targeting discrepancies-related emotion recognition deficits for therapeutic change are merely speculative. We encourage future research on whether our findings extend to discrepant perceptions as they exist in the therapy setting.

### Limitations

There were limitations to this study. First, we only examined structured interview reports of parent-adolescent discrepancies in relation to one measure of emotion recognition. Thus, our findings may not generalize to other methods of assessing emotion recognition. Specifically, the RMET assesses one domain of social cognition (i.e., ability to interpret emotional or thought-related content from a particular area of the face). It may be that these findings do not generalize to behaviors assessed using other measurement methodologies, such as social interaction tasks (e.g., Autism Diagnostic Observation Schedule; see Lord et al. 2000). We encourage future research that incorporates other methods of assessing emotion recognition or performance.

Second, our study was informed by recent theoretical work on precursors to the longitudinal links between informant discrepancies and child psychopathology (Goodman et al. 2010). Yet, we did not address our questions within a longitudinal study design. Nevertheless, our findings indicate that a set of socio-cognitive processes (i.e., emotion recognition) for which prior work indicates a relation to various psychopathology domains (e.g., autism spectrum disorders, conduct problems, and depressed mood; Baron-Cohen et al. 2001; Harkness et al. 2011; Sharp 2008) relate to parent-child discrepancies. Thus, we encourage future research to use our promising findings as a resource for conducting prospective longitudinal research on the links between parent-child discrepancies and child psychopathology.

Third, we were statistically underpowered to assess whether our findings interacted with participants' demographic characteristics, namely adolescent gender and the informant (i.e., parent vs. adolescent). Importantly, we conducted two secondary analyses in which we conducted the same analyses reported previously in text (i.e., entering TTI-Discrepant Beliefs scores as an independent variable and RMET total

scores as the dependent variable). We included an interaction term between TTI-Discrepant Beliefs and adolescent gender in one analysis, and an interaction term between TTI-Discrepant Beliefs and the Informant factor in another analysis. The interaction terms between TTI-Discrepant Beliefs and adolescent gender ( $p=0.97$ ) and the Informant factor ( $p=0.99$ ) were each non-significant. Relatedly, we examined a relatively small sample of parents and we could not report more complete estimates of socioeconomic status beyond that of family income. As mentioned previously, we were encouraged to find that our sample demographic estimates matched those of representative estimates of the larger geographic region of our sampling range (U.S. Census Bureau 2010). Nevertheless, we encourage researchers interested in replicating and extending our findings to examine larger, demographically varied samples of parents using more complete information regarding their socioeconomic status.

### Concluding Comments

Our findings suggest that parent and adolescent abilities to identify others' emotions (i.e., emotion recognition) relate to their perceptions of the discrepancies between their views about daily life occurrences. These findings are consistent with recent theoretical work seeking to understand the contexts within which parent-child reporting discrepancies may predict increased child psychopathology outcomes (Goodman et al. 2010). Further, we made our findings using psychometrically sound measurements of parent-child discrepancies, as well as performance-based measurements of their emotion recognition. These findings have important implications for measurement of both informant discrepancies and their associative characteristics. Notably, we encourage future research to take advantage of recent advancements in the measurement of both informant discrepancies (De Los Reyes et al. 2012b, 2013c) and emotion recognition (Baron-Cohen et al. 2001) to increase our abilities to understand and interpret informant discrepancies in both basic and applied developmental psychopathology research. In turn, this focus on improving the psychometric and empirical rigor of informant discrepancies research will improve our understanding of this important and pervasive construct's implications for developmental psychopathology research and practice.

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## Appendix

**Table 3** Frequencies (%) of topics endorsed on the Behavioral Conflict and Discrepant Beliefs sections of the To(may)to-To(mah)to Interview

Topic	Behavioral Conflict: parent report	Discrepant Beliefs: parent report	Behavioral Conflict: adolescent report	Discrepant Beliefs: adolescent report
Getting to watch TV shows and movies that you like	18 (36 %)	39 (78 %)	18 (36 %)	27 (54 %)
Getting to hang out with friends that you like	19 (38 %)	36 (72 %)	26 (52 %)	26 (52 %)
Getting to do fun things after school	16 (32 %)	25 (50 %)	21 (42 %)	26 (52 %)
Spending time with the rest of the family	18 (36 %)	24 (48 %)	8 (16 %)	18 (36 %)
Doing your homework	35 (70 %)	21 (42 %)	29 (58 %)	6 (12 %)
Getting to go to fun places with friends	24 (48 %)	37 (74 %)	32 (64 %)	27 (54 %)
Getting good grades	32 (64 %)	18 (36 %)	28 (56 %)	7 (14 %)
Getting to do what you want after dinner	23 (46 %)	36 (72 %)	18 (36 %)	33 (66 %)
Getting to go on the computer or talk on the phone with friends	27 (54 %)	40 (80 %)	21 (42 %)	28 (56 %)
Getting to hang out at friends' houses	21 (42 %)	31 (62 %)	26 (52 %)	22 (44 %)
Getting to wear clothes that you like	19 (38 %)	27 (54 %)	16 (32 %)	27 (54 %)
Getting to do things that you want to do on the weekend	31 (62 %)	31 (62 %)	29 (58 %)	31 (62 %)
Getting to spend time outside of the house with friends	23 (46 %)	32 (64 %)	25 (50 %)	22 (44 %)
Coming home right after school	11 (22 %)	24 (48 %)	14 (28 %)	21 (42 %)
Doing your chores	43 (86 %)	42 (84 %)	37 (74 %)	24 (48 %)
Keeping yourself clean	13 (26 %)	12 (24 %)	3 (6 %)	5 (10 %)

We list topics as phrased on the adolescent version. We phrased topics on the parent version in the parent's perspective (e.g., "your child keeping himself/herself clean"). We based frequencies for each topic on ratings of 1 (i.e., for Behavioral Conflict: "We argue or fight about this some of the time"; for Discrepant Beliefs: "We sometimes have the same beliefs, sometimes not") or 2 (i.e., for Behavioral Conflict: "We argue or fight about this a lot of the time"; for Discrepant Beliefs: "We have different beliefs")

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