Discrepancies in parents' and children's reports of child emotion regulation

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ABSTRACT

The ability to regulate one's emotions effectively has been linked with many aspects of well-being. The current study examined discrepancies between mothers' and children's reports of child emotion regulation. This investigation examined patterns of discrepancies for key aspects of emotion regulation (i.e., inhibition and dysregulated expression) and for three emotions (anger, sadness, worry). A total of 61 mother–child dyads (mean children's age = 9.3 years) participated. As hypothesized, discrepancies for inhibition subscales were of a larger magnitude than those for dysregulated expression subscales. Furthermore, age was related to discrepancies in both anger subscales, parent reports of child externalizing symptoms were related to anger dysregulated expression discrepancies, and child reports of internalizing symptoms were related to sadness dysregulated expression discrepancies. Overall, the findings suggest that patterns of discrepant reports are not random but rather may provide meaningful and useful information about the nature of emotion regulation.

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Introduction

Emotions can be broadly defined as nonpermanent motivating feeling states that occur in response to an individual's interaction with the environment (Barrett & Campos, 1987). The process of learning to regulate these complex and powerful feeling states is one of the most important tasks of childhood (Calkins & Hill, 2007; National Research Council & Institute of Medicine, 2000) and has been linked

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with many aspects of later well-being and adjustment (Southam-Gerow & Kendall, 2002; Spinrad et al., 2006; Zeman, Cassano, Perry-Parrish, & Stegall, 2006). Across multiple methods (e.g., questionnaire, interview, observation) and informants (e.g., parent, child self-report), deficits in emotion regulation (ER) abilities have been linked to internalizing and externalizing psychopathology (Casey, 1996; Suveg, Southam-Gerow, Goodman, & Kendall, 2007; Tull, Stipelman, Salters-Pedneault, & Gratz, 2009). Furthermore, understanding of the developmental trajectory of ER has informed treatment development and been linked with successful treatment outcomes (Suveg, Kendall, Comer, & Robin, 2006), suggesting that the study of ER is a highly relevant topic for clinical child/adolescent researchers.

Assessment of ER presents numerous methodological and conceptual challenges (Cole, Martin, & Dennis, 2004; Zeman, Klimes-Dougan, Cassano, & Adrian, 2007). Emotion and its regulation are elusive and dynamic processes that lack a "gold standard" for assessment, and measurement of ER is necessarily inferential (Cole et al., 2004). Researchers are encouraged to obtain information from multiple methods (e.g., questionnaire, observation) and informants (e.g., parents and children) (Cicchetti, Ackerman, & Izard, 1995; Zeman et al., 2007). However, even within one aspect of measurement such as questionnaire reports, different informants might not provide converging information. Indeed, research demonstrates that different informants contribute unique value and nonoverlapping predictive information in the study of child behavior (Kerr, Lunkenheimer, & Olson, 2007; Kraemer et al., 2003).

The fact that different informants often diverge in their reports of the same behavior poses profound challenges to the interpretation of findings in child development research. Because informant disagreement on ratings of child behavior and psychological symptoms is a consistent finding in the literature (Achenbach, McConaughy, & Howell, 1987; De Los Reyes & Kazdin, 2005), researchers might reasonably anticipate that parents and children will provide discrepant ratings of children's ER. Surprisingly, there is little empirical literature that sheds light on how parents and children differ in their reports of ER. To address this gap in the literature, our study investigated discrepant reports of ER using parallel parent and child report measures (Zeman, Cassano, Suveg, & Shipman, 2010; Zeman et al., 2007). A number of paper-and-pencil rating scales have been developed over the past decade to measure ER (Zeman et al., 2007), but researchers are left with few guidelines for making sense of conflicting information when it occurs. This study conceptualizes discrepancy itself as a useful construct and presents a novel approach for examining ER.

Much like ratings of psychopathology and behavior, there is inherent difficulty in obtaining reports from both parents and children on a construct that is sometimes not observable. Parents cannot directly observe children's thoughts and internal emotional states, and children may lack objectivity in their ratings of cognitive and emotional processes. Furthermore, even "observable" (i.e., behavioral) ER is subject to the observer's opportunity to "observe" the regulation. Research has shown that children report expressing emotion differently when in the presence of different social partners (e.g., Shipman, Zeman, Nesin, & Fitzgerald, 2003; Zeman & Garber, 1996; Zeman & Shipman, 1996, 1998), suggesting that informants might not be privy to the range of children's emotional functioning. In the absence of a gold standard informant, researchers must find ways to integrate information from different informants or make sense of discrepant information when it occurs (Achenbach et al., 1987; De Los Reyes & Kazdin, 2005; Kraemer et al., 2003). The primary purpose of the current study was to examine discrepant reports along inhibited and dysregulated dimensions of ER. A secondary goal was to examine child informants' characteristics associated with discrepancies. By examining informant discrepancies as a construct and investigating factors associated with discrepancies, we might glean important information from differing informant perspectives.

Informant agreement

The congruence or concordance in ratings between two informants is often referred to as "informant agreement." Correspondence and discrepancies are commonly used to examine informant agreement when the data are ordinal or continuous. Correspondence between informants addresses whether informants' ratings are correlated, whereas discrepancies or difference scores between informants reflect differences in informants' reports (Richters, 1992; Treutler & Epkins, 2003). Correspondence provides no information as to whether informants indicate a similar level or severity of

problems, whereas discrepancies are useful to highlight *which* informant reports fewer or greater problems.

Research suggests that the overt or covert nature of the ER strategy may be associated with informant discrepancies. Research examining parent and child agreement on behaviors of diagnostic importance suggests that the highest levels of agreement occur when parents and children are asked about concrete observable behaviors (e.g., Herjanic & Reich, 1982). Indeed, some research suggests that concordance among informants is greater for externalizing disorder symptomatology than for internalizing disorder symptomatology (Hawley & Weisz, 2003; Jensen, Traylor, Xenakis, & Davis, 1988; Kolko & Kazdin, 1993), indicating that concordance of reporters on externalizing symptomatology may be related to the behaviorally based, observable nature of many symptoms. For example, a symptom-level examination of parent–child agreement in youths assessed for anxiety disorders uncovered that agreement was highest for symptoms considered as observable and most likely to occur within the family context (Comer & Kendall, 2004).

Emotion regulation

We use Thompson's (1994) definition of ER as the modulation of emotional responses (increasing and decreasing the intensity of both positively and negatively valenced emotions) to achieve goals set within a social or environmental context. Inhibition refers to decreasing the intensity of emotional expression expressed (although not necessarily emotional experience) and hiding the experience of different emotions from others (Zeman, Shipman, & Penza-Clyve, 2001). Conversely, dysregulated expression refers to nonconstructive and possibly exaggerated expressions of emotion (Zeman et al., 2001, 2010).

Emotion specificity

Emotions are posited to serve an adaptive function in children's interactions with their environment and individuals with whom they interact (e.g., parents, peers). However, children's self-reported regulation of different emotions is likely to vary as a function of the affect expressed (Zeman et al., 2001). There is evidence to suggest that informants' recollection of children's ER varies by emotion. Levine, Stein, and Liwag (1999) found that children and parents agreed most often about children's goals during an emotional event when the event primarily evoked either happiness or sadness, less often when the event evoked fear, and least often when the event evoked anger. These discrepancies were related to discordant goals between informants in the situation (e.g., parent's desire to arrive at an appointment on time vs. child's desire to finish playing a game) (Levine et al., 1999). These findings suggest that parents may understand children's goals in an emotion-eliciting situation as a function of the emotion expressed. This may be related to children's differential regulation of emotions based on social acceptability or expected outcome. Specifically, low social acceptability of fear and anger may influence children's willingness to display such emotions, thereby reducing parents' ability to observe and understand children's experiences.

Associative characteristics

To use informant discrepancies as useful and meaningful information, it is important to understand why discrepancies occur. To this end, a body of empirical literature has examined associative characteristics of informant discrepancies on ratings of psychopathology (De Los Reyes & Kazdin, 2005). In this study, we consider informant characteristics to be related to parent–child discrepancies on ratings of ER.

Age

Based on studies that incorporate observational measures during childhood to investigate the developmental trajectory of ER (Cicchetti, Ganiban, & Barnett, 1991; Cole, Michel, & Teti, 1994), increasing sophistication with age is expected. As children age, they are better able to understand, articulate, and communicate their emotional experiences. Research using structured interview and vignette methodologies to query children's responses to emotion-provoking situations provides

evidence for increasing sophistication in children's ability to moderate their display of different emotions as a function of age (Shipman et al., 2003; Zeman & Garber, 1996). Younger children express sadness and anger significantly more than older children (Zeman & Garber, 1996) and use more frequent verbal and facial affective displays than older children (Shipman et al., 2003). These findings may be a result of increasing socialization pressure to manage affective displays as children age.

Given developmental increases in introspection, communication skills, and self-monitoring ability (e.g., Renouf & Kovacs, 1994), one would expect to see increases in agreement between parents and children over time. However, the relationship between child age and parent–child informant discrepancies in other domains of child functioning is mixed and inconclusive (De Los Reyes & Kazdin, 2005). For this investigation, 7- to 12-year-olds were selected to reflect a range of emotional competence concurrent with the development of cognitive skills. For example, during this time, children develop the ability to understand consciousness, become introspective, and develop a capacity for self-awareness (Stegge & Terwogt, 2007). These cognitive developments are related to a variety of changes in children's ability to understand and manage their emotions. For example, during this time children begin to moderate their display emotions as a function of who is observing them (e.g., peers, parents) (Zeman & Garber, 1996).

Child psychopathology

Given that psychopathology can be conceptualized as functionally impairing deficiencies in ER (e.g., Garnefski, Kraaij, & van Etten, 2005; Mullin & Hinshaw, 2007; Suveg & Zeman, 2004), psychopathology may be related to discrepancies in parent and child reports of child ER. For example, it is possible that children with internalizing psychopathology might have more extreme ER scores than children with no psychopathology and that these extreme scores make higher discrepancy mathematically more likely. However, it is also possible that behaviors associated with psychopathology may make parents more aware of children's ER, resulting in lower discrepancy scores. Finally, some literature suggests that psychopathology predicts discrepancies. For example, child psychopathology may inhibit child disclosure of information and thereby impair parental awareness of children's experiences and emotions (Goodman, De Los Reyes, & Bradshaw, 2010). Furthermore, depression may be related to informant discrepancies because informants' depressed mood is related to informants' reporting negative behaviors as opposed to positive behaviors (Richters, 1992), and research indicates that child depressive symptoms are related to parent–child informant discrepancies (De Los Reyes, Goodman, Kliewer, & Reid-Quiñones, 2008). Clearly, psychopathology is an important associative characteristic of discrepancies, although there is considerable complexity behind such associations.

The current study

The current investigation had two goals. First, we sought to examine discrepant perspectives on inhibited and dysregulated dimensions of ER for three different emotions. Second, we sought to examine the associative characteristics of discrepancies, specifically age and parents' and children's reports of psychopathology. Given past discrepant findings, specific hypotheses regarding the directions of the effects of age and reports psychopathology were not posed. Similarly, we examined child sex as an associative characteristic of discrepancies. Prior research suggests gender differences in child reports of ER (Zeman & Shipman, 1998) as well as in cross-informant agreement on ratings of internalizing symptoms (Grills & Ollendick, 2003; Krain & Kendall, 2000; Kiss et al., 2007). However, because prior work has not delineated gender differences in discrepant reports of ER, and because findings regarding gender differences for informant discrepancies are generally mixed and inconclusive (De Los Reyes & Kazdin, 2005), we did not have specific hypotheses regarding child sex as an associative characteristic. Given the findings suggesting that parents and children are more likely to agree on readily observable symptoms (e.g., Comer & Kendall, 2004; Herjanic & Reich, 1982), we hypothesized that visibility of behavior would influence discrepancies. Specifically, we predicted that discrepant reports of dysregulated expression (e.g., tantrum behavior) would be of lesser magnitude than discrepancies in reports of inhibition (e.g., cognitive rumination).

Method

Participants

A total of 61 children (41 girls and 20 boys) between 7 and 12 years of age (mean age = 9.3 years, SD = 1.6) and their mothers participated in this study. An additional 2 children participated but were not included; of these, 1 child's report was considered as invalid by the interviewer due to comprehension difficulties, and 1 participant was removed as a multivariate outlier. Children were recruited from local schools, churches, and community centers and were considered as eligible to participate if they had not been diagnosed with a pervasive developmental disorder, were not receiving mental health services, and were not taking a psychotropic medication.

The majority of children (n = 40, 65.6%) were Caucasian, 15 children (24.6%) were African American, 1 child (1.6%) was Asian, and 5 children (8.2%) were of mixed ethnic background. Most children (n = 41, 67.2%) resided with both parents, 19 children (31.1%) lived with their mothers, and 1 child (1.6%) had a different living arrangement. Annual family income was distributed across income levels as follows: ⩽$15,000 = 6.6%, $15,001 to $30,000 = 11.5%, $30,001 to $45,000 = 13.1%, $45,001 to $60,000 = 13.1%, $60,001 to $75,000 = 11.5%, $75,001 to $90,000 = 8.2%, >$90,001 = 32.8%. Two families (3.3%) declined to report annual income. Families were provided with a gift card as compensation for their time and participation.

Measures

Children's Anger, Sadness, and Worry Management Scales

The Children's Emotion Management Scales (CEMS) (Zeman et al., 2001) consist of an 11-item Anger scale (CAMS), a 12-item Sadness scale (CSMS), and a 10-item Worry Scale (CWMS) (Zeman et al., 2010) that children respond to on a 3-point Likert scale (1 = *hardly ever,* 2 = *sometimes,* 3 = *often*). Factor analysis yielded three factors: inhibition (e.g., "I get mad inside but I don't show it"), dysregulated expression (e.g., "I cry and carry on when I am sad"), and ER coping (e.g., "I try to calmly deal with what is making me feel mad"). Only inhibition and dysregulated expression scores were used in this analysis. Coefficient alphas for the current study for inhibition and dysregulated expression subscales, respectively, were as follows: anger, .74 and .66; sadness, .68 and .54; and worry, .78 and .50. Although we interpreted the results cautiously for the two scales with attenuated reliability scores (i.e., inhibition and dysregulated expression), we included them in our analyses because of their conceptual relevance to the study and because scales with smaller numbers of items may have lower alpha coefficients (Schmitt, 1996).

Children's Anger, Sadness, and Worry Management Scales–Parent Versions

The Children's Emotion Management Scales–Parent Versions (CAMS-P, CSMS-P, and CWMS-P) (Zeman et al., 2001) contain the same items that exist in the CEMS (described above), with each item modified to reflect a parent's perspective of the child's emotion management. Coefficient alphas for this study for inhibition and dysregulated expression subscales, respectively, were as follows: anger, .81 and .64; sadness, .81 and .72; and worry, .75 and .77. These alphas indicate acceptable reliability, particularly given the brevity of the subscales.

Child Behavior Checklist

Caregivers completed the most recent versions of the *Child Behavior Checklist* (CBCL) (Achenbach & Rescorla, 2001), a widely used and extensively researched measure of demonstrated reliability and validity. The CBCL provides a total behavior problem score, two broadband scales of internalizing and externalizing dysfunction, and several subscales (e.g., withdrawn, aggressive, anxious). Coefficient alphas for the current study were .81 and .86 for the internalizing and externalizing scales, respectively.

Revised Child Anxiety and Depression Scale

The *Revised Child Anxiety and Depression Scale* (RCADS) (Chorpita, Yim, Moffitt, Umemoto, & Francis, 2000) is a 47-item child self-report measure that assesses symptoms of several DSM-IV (*Diagnostic and Statistical Manual of Mental Disorders,* 4th edition) anxiety and depressive disorders (i.e., separation anxiety disorder, social phobia, obsessive–compulsive disorder, panic disorder, generalized anxiety disorder, and major depressive disorder). The measure has a strong psychometric profile, including Cronbach's alpha coefficients ranging from .71 to .85 and 1-week retest reliability coefficients ranging from .65 to .80. In addition, the RCADS depression scale correlated highly (.70) with the Children's Depression Inventory (CDI, a child self-report depression measure), whereas the several anxiety scales correlated highly with the Revised Child Manifest Anxiety Scale (RCMAS, a child self-report anxiety measure), offering good validity evidence. These psychometric data were confirmed in another study that included a confirmatory factor analysis (de Ross, Gullone, & Chorpita, 2002). Coefficient alphas for the current study ranged from .71 to .83.

Demographics

Parents completed a form that queried many family contextual variables, including family composition, minority status, income level, and parents' education level as well as individual variables such child's age and grade level.

Data analytic plan

The primary goals of this study were to (a) examine discrepant perspectives on dysregulated and inhibited dimensions of ER for three different emotions and (b) examine the associative characteristics of discrepancies, including age, sex, and reports of psychopathology.

Discrepancy scores calculation

Discrepancy scores were calculated by subtracting each child subscale score from the corresponding parent subscale score. To retain the directionality of the discrepancy scores, the signs (plus or minus) were maintained. Positive discrepancy scores indicate that mothers reported higher use of that ER strategy than children reported; conversely, negative discrepancy scores indicate that children reported higher use of that ER strategy than mothers. This method for calculating discrepancy scores has been used in prior work and facilitates interpretation of which informant endorsed higher levels of the construct (e.g., Treutler & Epkins, 2003).

To examine discrepancies among inhibited and dysregulated dimensions, we conducted a within-participants 3 (Emotion) × 2 (Subscale) analysis of variance (ANOVA) to test whether discrepancy scores varied as a function of subscale or emotion type. We conducted post hoc comparisons to test differences between the subscales within emotion type (i.e., sadness inhibition vs. sadness dysregulated expression) to follow up on any significant omnibus test.

To examine associative characteristics of discrepancies, we employed a series of hierarchical multiple regressions. Specifically, the regression analyses were constructed to test the contribution of age and child psychopathology to the discrepancy between parents' and children's reports on the six ER measures. In total, six regression analyses were planned—one for each discrepancy score. Age and sex were entered in Step 1, and RCADS total anxiety and depression, CBCL internalizing, and CBCL externalizing were entered in Step 2. For these analyses, age was entered as a continuous variable.

Results

Data preparation and preliminary analyses

Emotion regulation scale score calculation

Mothers' and children's perceptions of child ER were assessed using the parallel parent and child report forms of the CEMS. Subscale scores were computed by calculating the item mean to permit comparisons among subscales with different numbers of items. Scores for the two subscales of each

of the three emotion measures were calculated for both informants, resulting in a total of six subscale scores for each informant, all on the same metric (ranging from 1.0 to 3.0).

Descriptive statistics

Table 1 displays the means and standard deviations for all measures, numbers of children within the clinical range for the CBCL and RCADS, and the effect sizes (partial η^2) for differences between informant reports on the CEMS measures. Using Cohen's (1988) guidelines (.01 = small effect, .06 = moderate effect, .14 = large effect), it is clear that the differences between parent and child reports on the anger and sadness inhibition subscales demonstrate a very large effect size and that the differences between parent and child reports on anger dysregulation and worry inhibition demonstrate a small effect. Of the six subscales, only one demonstrated significant correlations between parent and child reports, namely worry dysregulated expression (r = .25, p = .048).

In addition, the means and standard deviations for the psychopathology measures were within expected ranges for a community sample (Achenbach & Rescorla, 2001; Chorpita et al., 2000). Table 2 displays correlations among each informant's report on the CEMS measures and three psychopathology variables used in subsequent hierarchical regression analyses.

Preliminary analyses

Table 3 displays discrepancy score characteristics, and Table 4 displays correlations among the discrepancy and psychopathology scores. Independent samples t tests and one-way ANOVAs with modified Bonferroni corrections uncovered no significant differences among the predictor and discrepancy score means by sex or race.

Primary analysis: Do discrepancy scores differ by emotion?

A 3 (Emotion: anger, sadness, or worry) × 2 (Subscale: inhibition or dysregulated expression) within-participants ANOVA was conducted to test whether discrepancy scores varied as a function of emotion or subscale. Because Mauchly's tests of the assumption of sphericity revealed violations of the assumption for our tests for main effect of emotion, $\chi^2(2)$ = 14.51, p = .001, and the interaction, $\chi^2(2)$ = 7.27, p = .026, in both cases, degrees of freedom were corrected using Huynh–Feldt estimates. The tests for the two main effects, emotion, $F(1.68, 100.93)$ = 5.58, p = .008, and subscale, $F(1, 60)$ = 20.75, p = .001, and the test for the interaction, $F(1.84, 110.64)$ = 4.21, p = .020, all were statistically significant. Because the interaction was significant, we conducted pairwise post hoc tests to probe for discrepancy differences by subscale across the three emotions: anger, sadness, and worry. Because we were conducting three tests, we used the Bonferroni correction, setting our family wise error rate at

Table 1
Means and standard deviations of measures for the total sample.

Measure	Parents [M (SD)]	Children [M (SD)]	Partial η^2	Clinical [n (%)]
Children's Anger Management Scale				
Inhibition	1.34 (0.39)	1.72 (0.53)	.27[**]	
Dysregulated expression	1.68 (0.49)	1.56 (0.52)	.04	
Children's Sadness Management Scale				
Inhibition	1.38 (0.43)	1.85 (0.55)	.35[**]	
Dysregulated expression	1.73 (0.58)	1.75 (0.49)	.00	
Children's Worry Management Scale				
Inhibition	1.65 (0.37)	1.76 (0.46)	.04	
Dysregulated Expression	1.73 (0.31)	1.73 (0.44)	.00	
CBCL internalizing T score	51.03 (8.80)			3 (4.9)
CBCL externalizing T score	49.89 (8.97)			3 (4.9)
RCADS total anxiety and depression T score		48.52 (10.41)		6 (9.8)

Note. N = 61. Emotion management measures were rated on 3-point scale. Subscale means represent item mean for each subscale. CBCL, Child Behavior Checklist; RCADS, Revised Child Anxiety and Depression Scale.
[**] p < .01.

Table 2

Correlations among parent- and child-report CEMS subscale scores and predictors

Variable	Gender	Age	CBCL internal.	CBCL external.	RCADS
Parent reports					
Anger					
Inhibition	−.12	.28[*]	−.05	−.16	.04
Dysregulation	.12	−.01	.14	.44[**]	−.01
Sadness					
Inhibition	−.01	.02	.01	−.01	−.08
Dysregulation	.02	−.10	.42[**]	.42[**]	−.05
Worry					
Inhibition	−.26[*]	.19	−.03	−.08	.03
Dysregulation	.06	.19	.02	.20	−.03
Child reports					
Anger					
Inhibition	−.15	−.20	−.11	−.04	.05
Dysregulation	.03	.43[**]	.06	.06	.33[*]
Sadness					
Inhibition	−.18	−.05	.18	.03	.08
Dysregulation	.19	.013	−.01	.19	.44[**]
Worry					
Inhibition	−.19	−.01	−.04	.02	−.27[*]
Dysregulation	−.03	−.01	.02	.11	.35[**]

Note. CBCL external, Child Behavior Checklist externalizing score; CBCL internal, Child Behavior Checklist internalizing score; CEMS, Children's Emotion Management Scales; RCADS, Revised Child Anxiety and Depression Scale.
[*] $p < .05$.
[**] $p < .01$.

Table 3

Discrepancy score characteristics.

	Range	M	SD	Skewness	Kurtosis	r
Anger						
Inhibition	−1.75 to 1.00	−0.39	0.64	−0.25	−0.31	.08
Dysregulation	−1.67 to 1.33	0.13	0.64	−0.39	0.08	.20
Sadness						
Inhibition	−2.00 to 1.75	−0.47	0.64	0.35	1.52	.16
Dysregulation	−1.00 to 1.67	−0.02	0.68	0.23	−0.36	.21
Worry						
Inhibition	−1.50 to 1.25	−0.11	0.54	−0.09	0.34	.18
Dysregulation	−1.33 to 0.67	−0.01	0.47	−1.01	1.29	.25[*]

Note. N = 61. The possible range for discrepancy scores is −2.00 to 2.00. Correlations between parent and child subscale scores are shown.
[*] $p < .05$.

.05 (α = .05/3 tests = .017). Post hoc tests revealed that for both anger and sadness, the discrepancy score for inhibition was of significantly greater magnitude than the discrepancy score for dysregulated expression; subscale scores were not significantly different for worry. Specifically, the discrepancy was of significantly greater magnitude in anger inhibition (M = −.39, SD = .08) than in anger dysregulated expression (M = .13, SD = .08), $t(60)$ = −3.65, p = .001, r = .18. For sadness, the discrepancy was of significantly greater magnitude in inhibition (M = −.47, SD = .08) than in dysregulated expression (M = −.02, SD = .08), $t(60)$ = −3.71, p = .001, r = .19. These analyses are depicted graphically in Fig. 1.

Hierarchical regression analyses: Contributions of age and psychopathology

Overview

    To examine the relation among age, measures of psychopathology, and parent–child discrepancies, a series of six hierarchical multiple regression analyses were conducted. For each regression, one

Table 4
Correlations among discrepancy and predictor scores.

Variable	Gender	Age	CBCL internal.	CBCL external.	RCADS
CBCL internalizing	−.16	−.01		.42[**]	−.13
CBCL externalizing	.06	.04	.42[**]		.00
RCADS total	.09	.05	−.13	.00	
Anger					
Inhibition discrepancy	.06	.34[**]	.06	−.07	−.02
Dysregulation discrepancy	.07	−.36[**]	.06	.28[*]	−.27[*]
Sadness					
Inhibition discrepancy	.15	.05	−.14	−.04	−.13
Dysregulation discrepancy	−.12	−.09	.36[**]	.22	−.36[**]
Worry					
Inhibition discrepancy	−.01	.14	.02	−.07	.26[*]
Dysregulation discrepancy	.07	.13	−.01	.03	−.35[**]

Note. CBCL externalizing, Child Behavior Checklist externalizing T score; CBCL internalizing, Child Behavior Checklist internalizing T score; RCADS, Revised Child Anxiety and Depression Scale.
[*] $p < .05$.
[**] $p < .01$.
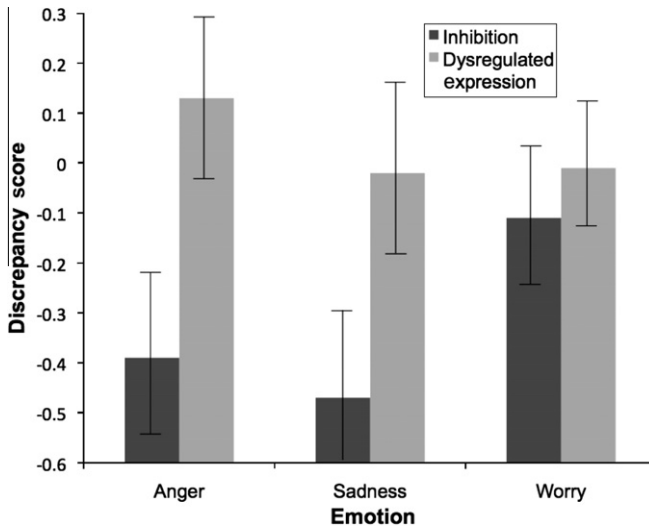
Fig. 1. Comparison of emotion and subscale means with error bars representing 95% confidence intervals.

discrepancy score served as the dependent variable, age and sex were entered in Step 1, and psychopathology scores were entered in Step 2. Evaluation of the variables revealed acceptable normality of predictor variables, and no transformations were necessary. No outliers among the cases were identified, and no cases had missing data. Analyses failed to reveal an effect of sex. For all analyses, adjusted R^2 values were subsequently used to interpret amount of variance accounted for by the model to correct for the relatively small sample size. Table 5 displays beta weights for predictor variables across all significant regressions. Results for the worry scales and sadness inhibition scales were not significant; thus, they are not discussed.

Anger inhibition

A multiple regression analysis revealed that the combination of the demographic independent variables was significantly related to the discrepancy in anger inhibition, adjusted $R^2 = .09$, $F(2, 58) = 4.00$, $p = .024$, in Step 1. Step 2 of the regression with all independent variables entered revealed that a

Table 5
Hierarchical multiple regression analyses predicting anger inhibition, anger dysregulation, and sadness dysregulation discrepancy scores from demographic and psychopathology variables.

Predictor	Discrepancy score					
	Anger inhibition		Anger dysregulation		Sadness dysregulation	
	Adjusted ΔR^2	β	Adjusted ΔR^2	β	Adjusted ΔR^2	β
Step 1	.09*		.11*		−.01	
Gender		.07		.05		−.12
Age		.34**		−36**		−.10
Step 2	−.02		.13**		.19**	
Gender		.10		.04		−.06
Age		.35**		−36**		−.08
RCADS total		−.03		−.28*		−.32**
CBCL internalizing		.14		−.11		.27
CBCL externalizing		−.15		.34**		.12

Note. CBCL internalizing, Child Behavior Checklist internalizing score; CBCL externalizing, Child Behavior Checklist externalizing score; RCADS, Revised Child Anxiety and Depression Scale.
* $p < .05$.
** $p < .01$.

combination of all independent variables was not significantly related to anger inhibition discrepancy. Only one of the variables was a significant predictor of anger inhibition, namely age (β = .34, t = 2.79, p = .007). An increase in age was associated with parents reporting more anger inhibition than children.

Anger dysregulated expression

The linear combinations of both demographic variables alone, as well as all five independent variables, were significantly related to the discrepancy in anger dysregulated expression scores. Age and sex alone predicted 11% of the variance in the anger dysregulated expression discrepancy, adjusted R^2 = .11, $F(2, 58)$ = 4.52, p = .015. The addition of psychopathology variables improved the equation; after Step 2, R^2 = .30, $F(5, 55)$ = 4.71, p = .001. A closer examination of the regression coefficients reveals that age (β = −.36, t = −2.96, p = .002) was the most potent contributor, followed by CBCL externalizing (β = .34, t = 2.71, p = .009) and RCADS total (β = −.28, t = −2.42, p = .019). A decrease in age and RCADS total score predicted an increase in anger dysregulated expression discrepancy score, meaning that as age increased and children reported more total anxiety and depression, children reported more dysregulated expression of anger than parents. Furthermore, an increase in parent reports of externalizing behavior was associated with parents reporting more dysregulated expression of anger than children.

Sadness dysregulated expression

Results of the hierarchical multiple regression reveal that after Step 2, with all independent variables in the equation, the model predicted sadness dysregulated expression discrepancies, adjusted R^2 = .18, $F(5, 55)$ = 3.71, p = .006. Of the five variables, one accounted for most of the variance of sadness dysregulated expression discrepancies, namely RCADS (β = −.32, t = −3.08, p = .009). An increase in RCADS total score predicted a decrease in sadness dysregulated expression discrepancy scores; as RCADS scores increased, children reported higher levels of dysregulated expression of sadness than parents.

Discussion

Despite a growing interest in multimethod assessment of child ER, there is a dearth of literature to guide researchers in conceptualizing and using discrepant information in this area. This investigation examined discrepancies between parents' and children's reports of child ER in an effort to provide an

empirical foundation for future research to use discrepant reports of ER as useful and meaningful information. We extended the literature on three fronts, and in doing so we provided evidence that the novel application of this methodology to the study of ER may facilitate interpretation of information gleaned from multimethod approaches in research or clinical contexts. First, we examined the magnitude and direction of discrepancies for two aspects of ER. Specifically, we compared discrepancies for dysregulated and inhibited expression. Second, we examined discrepancies for three emotion types: anger, sadness, and worry. Finally, we examined characteristics associated with discrepancies, including child age and psychological adjustment (i.e., internalizing and externalizing symptoms) measures. We hypothesized that discrepancies for inhibition subscales would be of a greater magnitude than discrepancies for dysregulated expression subscales.

Consistent with our hypothesis, children reported more frequent use of inhibition than their parents across all three emotions. This effect was more pronounced for anger and sadness than for worry. Among the associative characteristics of discrepancies investigated, a number of significant patterns emerged. Specifically, age emerged as a significant predictor of discrepancies for the two anger subscales measuring maladaptive regulation. Child reports of internalizing symptoms (i.e., RCADS) was associated with children reporting more dysregulated expression of sadness and anger than parents. In addition, parent reports of child externalizing symptoms (i.e., CBCL externalizing scale) was associated with parents reporting more dysregulated expression of anger than children. In contrast to some past work, child sex was not a significant predictor of discrepancy. We review these main findings below and discuss clinical implications and suggestions for future research.

The primary purpose of this study was to examine whether discrepancy scores differed systematically based on two key dimensions of ER: inhibition and dysregulated expression. Consistent with our hypotheses, children reported using significantly more inhibition across emotion type than parents. Parents reported significantly more use of dysregulated expression than children. Given that inhibition of emotion is covert and relatively unobservable, parents may be less likely to endorse inhibition of emotion because they cannot observe this aspect of ER.

Furthermore, discrepancies varied significantly by emotion type. An interaction effect emerged such that children reported higher levels of inhibition across all emotions than parents, and the discrepancies were stronger for anger and sadness than for worry. These findings underscore the importance of considering regulation for specific emotions rather than examining ER more broadly for different forms of negative affect (e.g., Cisler, Olatunji, Feldner, & Forsyth, 2010). This finding appears to be somewhat at odds with the existing research on parent–child agreement for emotions. Levine and colleagues (1999) found the highest levels of concordance in parent–child agreement of situational details when asked to report on an event that evoked either sadness or happiness and found the lowest concordance when the event evoked anger. This effect may be partially explained by context specificity; it is possible that when asked about a specific event, parents and children are able to jointly identify triggers for sad situations, but parents and children do not share the same jointly held perceptions about children's regulation of that sadness when asked without reference to a specific situational context, as is the case with the CEMS measures.

Age demonstrated a predictive relation with regard to discrepancies in reports of anger. As child age increased, parents reported more child inhibition of anger relative to child reports and children reported more dysregulated expression of anger relative to parent reports. Given developmental increases in introspection, communication skills, and self-monitoring ability (e.g., Kraemer et al., 2003; Renouf & Kovacs, 1994), it is expected that over time children would become more reliable reporters of their emotional experience and behavior. These findings suggest that increasing cognitive sophistication might not be related to the development of agreement with parental perspectives.

The unique relation between age and discrepancies in parent and child reports of anger regulation raises questions regarding the development of emotion socialization. Parental socialization of emotion plays an important role in the development of ER (Eisenberg, Cumberland, & Spinrad, 1998). Anger is an affective state that communicates displeasures or dissatisfaction and can serve to warn others in the interpersonal system of an impending attack (Garside & Klimes-Dougan, 2002), unlike sadness and worry, which are generally internally oriented negative emotions. Age-related differences may reflect the development of parental socialization and contingency responding in which parental responses to displays of anger shape child expression in the presence of those parents (Garside &

Klimes-Dougan, 2002). Indeed, past work by Zeman and Garber (1996) suggests that achievement of parent–child agreement about children's expression and experience of anger is complicated by two facts. First, children appear to regulate their emotional expression differently in the presence of different individuals. Second, child willingness to express anger varies as a function of age, with younger children reporting more willingness to express anger than older children. Perhaps the increase in parent reports of anger inhibition associated with age was partially accounted for by children's decreasing willingness to express anger in front of their parents. Similarly, children's increased reports of dysregulated expression with increased age may have reflected expression of anger that occurs outside of the home context. However, further research is needed to replicate and clarify the relation between age and discrepancies in informant reports of anger regulation.

Parent and child reports of psychopathology were also associated with discrepancies in informant reports of ER, a finding concordant with the relations between various mental disorders and ER found in other studies (Casey, 1996; Silk, Steinberg, & Morris, 2003; Sim & Zeman, 2004). Increased parent reports of externalizing behavior on the CBCL was associated with increased parent reports of dysregulated expression of anger, and child self-reports of psychopathology predicted discrepancy in the sadness dysregulated expression subscale. These data represent modest validity evidence for the CEMS measures. To the extent that a reporter views the child as experiencing higher levels of symptoms, that reporter also views the child as regulating feelings relevant to the symptoms more poorly than the other reporter. The finding that child reports of anxiety and depression were related to increased child reports of sadness dysregulated expression also recalls work by Suveg and Zeman (2004), whose research suggested that children with anxiety disorders reported less regulated expression of emotion across a variety of scenarios designed to evoke anger, sadness, and worry than did children without an anxiety diagnosis.

There are a number of important caveats to this study. Broadly, the exploratory nature of this study dictates that all conclusions and inferences be drawn cautiously. The small sample size both limited power and increased the possibility for spurious sample effects. Furthermore, limitations related to method variance must be considered; we were limited to two reporters, and conducting analyses with multiple measures provided by the same individual may inflate the strength of predictive relations. Individual reports of a trait reflect the observer's unique perception, which has elements of both bias and accuracy (Rowe & Kandel, 1997). Bias and "true" unique perspectives are extremely difficult to parse out, and researchers frequently employ the use of the multitrait–multimethod model (Campbell & Fiske, 1959) to apportion the variance attributable to a specific trait or construct. This study examined composite scores derived from the difference between two informant reports and the associations of those difference scores with reports of other constructs by those same informants, inflating the power of the source (informant) and method (paper-and-pencil other- and self-reports) variance. This methodological weakness may account for some of the findings, for example, congruence between parent reports of psychopathology and higher parent reports of anger or sadness regulation. This study would have been strengthened by the inclusion of observational data or reports from other informants. For example, an experimental design that elicits ER processes in variable contexts under controlled conditions in conjunction with the study of discrepancies may provide additional insight into this complicated process (Cole et al., 2004).

In addition, although it may be tempting to extrapolate findings to clinical samples, it is important to recall that despite the use of clinical instruments to assess levels of psychopathology, this research used a community-based sample; thus, findings might not be applicable to clinical populations. Similarly, the discrepancy scores under investigation are the differences between mothers' and children's reports and, thus, are not generalizable to discrepancies that may occur between children and other reporters such as fathers and teachers.

Despite these shortcomings, this research demonstrates the applicability of discrepancy analysis methodology to the study of ER and revealed several interesting patterns of findings that warrant further investigation and may have clinical implications. First, the emerging patterns suggest that the way in which parents and children recall and interpret children's emotional experiences may differ systematically. The issue of context specificity is important to consider. Without the anchor of a specific context in which to consider children's emotional expression or use of ER strategies, differences in parents' and children's recall and interpretation may be better explained by biases in memory that

result from not having specific contextual clues (De Los Reyes & Kazdin, 2005). Future research might add context specificity to parallel ER measures to examine error variance that contributes to discrepancies.

A final potentially clinically relevant pattern of findings warranting further research and clarification entails the association between child reports of anxiety and depression and children's increased reporting of dysregulated or inhibited expression compared with their parents' reports. It is possible that this pattern characterizes children who may be highly sensitive to and distressed by symptoms of emotional arousal that do not necessarily rise to the level of detection by their parents. This arousal sensitivity is convergent with literature proposing that sensitivity to biological sensations of anxiety is a risk factor for anxiety (McNally, 2002; Reiss, 1991) and emotional disorders (Allen, McHugh, & Barlow, 2008). If further research supports this pattern of findings, clinicians should be aware that children's reports of dysregulation may be a good and understandable predictor of anxiety and/or depression problems, and clinicians would be wise to avoid the practice of ruling out problems based solely on parents' reports. Instead, the "or rule" of diagnosis (Jensen et al., 1995), where a symptom is considered as present if it is endorsed by either informant, may be most appropriate.

This study provides a foundation for clinicians and researchers to make sense of conflicting information in the study of ER. Although informant discrepancies can create profound interpretive dilemmas for researchers and clinicians, our results suggest that conceptualizing discrepancy as a construct might provide useful and meaningful information. A focus on discrepant reports of ER can enrich our understanding of ER itself because discrepancies can provide unique information that cannot be obtained by combining informants' reports or examining reports separately.

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