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ORIGINAL PAPER

Initial Validation of the Children's Worry Management Scale

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Abstract We investigated the psychometric properties of a new instrument, the Children's Worry Management Scale (CWMS). The CWMS has three subscales that specify methods of regulating worry: inhibition (the suppression of worry), dysregulation (exaggerated displays of worry), and coping (constructive ways of managing worry). Using a Caucasian, middle-class sample of 214 children ($M = 9$ years, 1 month), Study 1 provides reliability and validity data through patterns of correlations to parent- and child-completed measures of emotion management and behavioral problems. Internal consistencies range from .69 to .74. Study 2 establishes discriminant validity by demonstrating that the CWMS Dysregulation and Coping subscales differentiated, in the expected directions, between a group of children ($n = 27$) with DSM-IV anxiety diagnoses and a control group of children with no psychological disorders.

Keywords Worry · Emotion regulation · Coping · Inhibition · Dysregulation

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Introduction

Worry is comprised of several elements that include a preoccupation with past or future negative events, persistent and intrusive thoughts or images regarding potential negative outcomes, difficulty controlling thoughts, and negative affective tone (Borkovec et al. 1983). Theoretically different than *basic emotions*, the construct of worry is most consistent with the description of *emotion schemas*, an interaction between affect, perception, and cognition that influences mental processes and behavior (Izard 2009). Although there has been considerable debate in the literature distinguishing worry from the constructs of fear and anxiety, it appears that many researchers agree that worry comprises the cognitive component of anxiety, whereas fear involves the physiological or "biological alarm" system (Silverman et al. 1995, p. 672). Excessive worry is characterized by unproductive problem-solving efforts that do not lead to the resolution of the problem but rather to ruminative processes (Muris et al. 2004). Although worry is considered a cognitive phenomenon, it is often associated with physiological distress (e.g., stomachaches, muscle tension) when in its pathological form (Eisen and Engler 1995).

Worry is considered to be a normative experience that increases with development (Muris et al. 1998, 2002; Orton 1982; Vasey et al. 1994). In particular, as cognitive development becomes increasingly differentiated and sophisticated, the capacity to envision negative outcomes increases; consequently, the frequency of worry increases with age (Muris et al. 2002). For example, Vasey et al. (1994) examined differences in worry among 5–6, 8–9 and 11–12 year-old-youth and found that worry was more frequent in youth ages 8 and older than in younger children. Further, youth older than eight exhibited a greater breadth of worry content and were able to more fully

articulate the potential negative outcomes of events than the youngest group. By the end of middle childhood, over 70% of fifth and sixth grade children reported being worried about 10 or more concerns (Orton 1982) and approximately 70% of elementary school children endorsed that they worry "occasionally." Further, 6.7% of fifth and sixth grade children meet criteria for a DSM anxiety disorder diagnosis (Muris et al. 1998). Research on gender differences in the experience of worry are equivocal with some finding support for greater worry among girls (Bell-Dolan et al. 1990; Silverman et al. 1995) and other research finding no differences (Muris et al. 2002).

Though worry is a normative developmental phenomenon, chronic excessive worry is characteristic of pathological anxiety such as that found in individuals experiencing Generalized Anxiety Disorder (GAD; Weems et al. 2000). Researchers have provided ample documentation of the prevalence and the types of stimuli that evoke worry in normally functioning children (Vasey and Daleiden 1994). In addition, there is a large volume of research conducted on childhood anxiety disorders for which worry is a key component (Kendall and Suveg 2006). Unfortunately, there is a lack of research that provides a bridge connecting the findings from one domain to the other. Yet, from a developmental psychopathology perspective (Rutter and Sroufe 2000; Sroufe 1990) the examination of childhood processes is best conducted by the simultaneous examination of normal and abnormal development as they are "mutually defining" (Sroufe 1990, p. 340). This type of approach is reciprocally informing because (a) key developmental tasks are most readily identified and defined by the consequences of failed achievement, and (b) understanding psychopathology as a developmental deviation inherently implies a comparison that requires an understanding of typical development. The case of childhood worry is an exemplar of the benefits accrued when studying normative and atypical worry in concert. The goal of this study is to provide an initial step in this direction by presenting the findings of a newly created and validated measure that assesses *how* children report managing *normative* worry experience and by linking particular management styles with anxiety disorders in youth.

Surprisingly few validated measures exist that exclusively assess specific regulatory aspects of normative worry experience, and to our knowledge, there are no questionnaires that ask children *how* they manage their worry. The majority of available measures evaluate the type and frequency of worry experience through interview format or questionnaire. For example, *The Worry Inventory for Children* (WIC; Silverman et al. 1995) uses a semi-structured interview format and asks children about their intensity, frequency, and perceived reality of worries in 14 domains such as social relationships, academics, and personal harm. Similarly, the *Worry List Questionnaire* (WLQ; Simon and Ward 1974) provides a list of 100 items in eight categories to which the child indicates whether the item "worries them often, deeply or upsets them badly." *The Worries Inventory* (Orton 1982) also assesses the occurrence of specific sources of worry by having children use a 3-point scale to rate the frequency of 62 worries.

An additional line of research has created measures that assess pathological aspects of childhood worry. The Worry/Oversensitivity scale of the *Revised Children's Manifest Anxiety Scale* (RCMAS; Reynolds and Richmond 1978, 1985) uses a dichotomous scale to assess children's perceptions of the presence of worried thoughts (e.g., "I worry a lot of the time", "I am nervous") and provides norms to differentiate between normal and clinically significant levels of worry. A downward extension of the adult version of *The Penn State Worry Questionnaire* was created (PSWQ-C; Chorpita et al. 1997) and subsequently revised for use with children and adolescents (Muris et al. 2001). Using a 3-point scale, children rate the frequency with which they experience generalized, uncontrollable, and excessive worry (e.g., "I have been a worrier all my life"). The *Spence Children's Anxiety Scale* (SCAS; Spence 1998) is a self-report questionnaire that uses a 4-point scale to rate the frequency of 38 items related to anxiety that load onto six factors that reflect DSM-IV anxiety diagnoses with only seven questions directly asking about specific types of worry experience.

Although the reviewed scales all provide useful ways of assessing frequency and type of worry in addition to documenting the existence of non-normative levels of worry, an obvious absence is a focus on the ways that children manage their normative worries. Thus, the overarching goal of our research was to create a brief scale that assesses children's self-reported methods of regulating or managing their worry that can be used for both research and clinical purposes. The structure of the CWMS was based in part on Speilberger's (1998) model of emotion expression that includes constructs of internalized and externalized expressions of emotion. Subsequent research with children has utilized and validated this conceptual structure with anger (Hagglund et al. 1994) and sadness expression (Zeman et al. 2001). We anticipate that the CWMS can be used as a normative index of worry management skills, a clinical screening tool, and/or a measure of intervention change. It is our hope that this research will contribute to the normative emotional development literature by adding a psychometrically sound instrument to a meager body of emotion assessment tools for children (see Zeman et al. 2007, for a review). Likewise, it also adds to the child clinical literature by providing information on the ways in which children manage their worry experiences, aiding in the differentiation of normal from pathological

worry, and offering a way to measure potential change in worry management as an outcome of intervention.

In the present research, two studies were conducted to achieve these goals. In study one, children of elementary school age (6–12 years) were chosen to participate because of their requisite cognitive skills and self-awareness to report on their worry experience (Ialongo et al. 2001). In order to investigate the reliability and validity of the scale, children completed a series of questionnaires assessing their emotion management strategies for worry, sadness, and anger while parents completed established measures of their child's behavior and emotion regulation competencies. In study two, a sample of children ages 8–12 years with DSM-IV anxiety disorder diagnoses also completed the scale in order to provide an index of discriminant validity. Given that research has been mixed concerning gender differences in worry experience (Bell-Dolan et al. 1990; Silverman et al. 1995) but within the emotional development realm gender differences are often found (Brody and Hall 2000; Saarni 1999; Zeman and Garber 1996), analyses of the CWMS scales examined potential gender differences.

Study 1

Method

Participants

Participants were 214 children ranging in age from 6 to 12 years with 107 boys (M age = 9 years, 1 months, SD = 20 months) and 107 girls (M age = 9 years, 3 months, SD = 17 months). Children were recruited from public elementary schools in a small, urban area and only those children with parent/guardian consent and child verbal assent participated. The majority of participants were Caucasian (95%) and from middle to upper class SES (Hollingshead, 1975, unpublished manuscript; Level 1: 36.0%; Level 2: 44.9%; Level 3: 8.7%; Level 4: 9.3%; Level 5: 1.2%) which was primarily due to high levels of education rather than income. Children participated with either their mother (N = 152) or father (N = 62). Because there were no significant parent gender differences on any variables in question, parent gender was collapsed for all analyses. Regarding family constellation, the majority of children lived with their biological parents (81.4%), with the remainder of children living with their mother only (12.0%), mother and stepfather (5.7%), and father only (0.9%).

Procedure

The present study was part of a larger project examining relations between parental emotion socialization practices and children's emotional development (Cassano et al. 2007). Although children were initially recruited through the public schools, children and their parent then completed a research protocol as part of a 90-min session at their home or in a University laboratory. Graduate students in clinical psychology provided parents with a set of questionnaires that they completed independently but children were read aloud all questionnaires that were presented in random order. Parents were given $10 and children were given a small token (e.g., folder) for participating.

Scale Development

The overall approach to scale development was guided by traditional test construction principles (Clark and Watson 1995; Loevinger 1957). Specifically, an initial pool of items was selected that encompassed key facets of worry management in childhood as identified in the developmental and clinical literature. The initial pool of items was then administered to 20 children who were asked whether or not items and response options were understandable. Parents of these 20 children were also asked about the relevance and importance of each item. Based on positive feedback from children and parents, no modifications to items were warranted. As described below, in Study 1 weak items were identified through psychometric analyses (i.e., corrected item-total correlations) and removed from the emerging scales.

Prior research has indicated a primary dichotomy in ways that adults express negative emotion, referred to by Spielberger (1998) as anger-in and anger-out. Anger-in refers to the suppression or inhibition of emotion whereas anger-out characterizes the externalized expression of emotion. Consequently, the Children's Worry Management Scale (CWMS) sought to maintain this distinction but also added items that would reflect constructive efforts to manage worry and strategies that are most strongly associated with the emotion of worry (e.g., avoidance). To this end, 15 items were initially created and used in the construction of the Children's Worry Management Scale that were purported to assess behaviors specific to the management of worry, such as "I avoid whatever it is that makes me feel very worried". Previous evaluations of self-report instruments for middle-childhood-age children indicated that valid assessment of emotion-related constructs was possible with relatively brief scales that used a limited number of response options (Chambers and Johnston 2002; Ialongo et al. 2001; Zeman et al. 2001). Although it would have been desirable to begin with a larger item pool, it was decided to create an instrument that was as brief as possible to optimize accuracy of responses and minimize burden. Consistent with previously validated self-report instruments designed to assess emotion regulation (Zeman et al. 2001),

children responded to questions on a 3-point scale (1 = *hardly ever*, 2 = *sometimes*, 3 = *often*) concerning how frequently they exhibited the emotion management item. Analyses of the CWMS scales examined potential gender differences given the literature that indicates boys and girls manage their emotional expressivity differently due to unique gender socialization experiences (Zeman et al. 2006 for a review).

Scale Development Analyses

All statistical analyses were conducted using SPSS, version 14.0. Initial evaluation of corrected item-total correlations (ITC) revealed that five items were not highly associated with the other items (ITCs under .40). These items were discarded, resulting in a 10-item scale.

Principal components analyses with varimax rotation extracted three factors that accounted for 66.8% of the variance. To maximize accuracy, only factors with eigenvalues greater than 1.0 were retained, with factor loadings exceeding .40 (Browne 1968; Cattell and Jaspers 1967). Items and their loadings, scale means, and standard deviations can be found in Table 1 and gender differences can be found in Table 2.

The eigenvalue of the first factor was 2.38; the second factor, 1.81; and the third factor, 1.47. Four items that referred to the inhibition of worried feelings loaded on the first factor that was termed "Inhibition." The internal consistency was .74 and accounted for 27.1% of the variance. A significant gender effect emerged for this factor such that girls reported inhibiting the expression of their worried feelings more than boys, $t(212) = 2.53$, $p < .01$.

Three items loaded on the second factor. Because each item referred to the non-constructive expression of worried feelings, this factor was labeled "Dysregulation." The coefficient alpha for this scale was .72 and accounted for 22.1% of the variance. No gender difference emerged for this factor.

Finally, three items that referred to adaptive coping with worry experience loaded on the third factor labeled "Coping." Internal consistency was .69 and accounted for 17.9% of the variance. No gender difference emerged for this factor.

Assessment of Validity

The following measures were administered to parents and children in order to obtain indices of convergent and

Table 1 Principal components analysis with varimax rotation of CWMS, means and standard deviations of items

	Factor loadings				
	1	2	3	*M*	SD
Inhibition					
2. I show my worried feelings (reversed scored)	**.65**	−.39	−.21	2.12	.74
3. I hold my worried feelings in	**.74**	.01	−.10	1.93	.76
6. I hide my worried feelings	**.85**	.01	.01	1.92	.80
8. I get worried inside by don't show it	**.76**	.10	.24	1.97	.76
Dysregulation					
5. I do things like cry and carry on when I'm worried	−.01	**.77**	−.01	1.60	.71
7. I keep whining about how worried I am	−.01	**.81**	−.01	1.44	.73
9. I can't stop myself from acting really worried	.01	**.72**	.01	1.89	.73
Coping					
1. I keep myself from losing control of my worried feelings	.38	−.16	**.60**	2.16	.76
4. I talk to someone until I feel better when I'm worried	−.36	.12	**.70**	2.09	.73
10. I try to calmly settle the problem when I feel worried	−.01	−.01	**.82**	2.25	.69

Table 2 Mean scores and standard deviations for the CWMS inhibition, dysregulation, and coping scales by gender

Factors	Across gender, $n = 214$	Boys, $n = 107$	Girls, $n = 107$	*t*-value, $df = 212$
Inhibition	8.28 (2.19)	7.74 (2.22)	8.58 (2.22)	2.79*
Dysregulation	4.75 (1.65)	4.73 (1.72)	4.78 (1.43)	−.20
Coping	6.47 (1.58)	6.36 (1.62)	6.54 (1.36)	.85

* $p < 01$

Table 3 Descriptive statistics for the CWMS, CSMS, CAMS, ERC, EESC, and CBCL

Measures	Mean (SD)	Range
CWMS		
Inhibition	8.28 (2.19)	4.00–12.00
Dysregulation	4.73 (1.65)	3.00–9.00
Coping	6.47 (1.55)	3.00–9.00
CSMS		
Inhibition	7.70 (2.13)	4.00–12.00
Dysregulation	5.21 (1.63)	3.00–9.00
Coping	10.84 (2.23)	5.00–15.00
CAMS		
Inhibition	6.97 (1.94)	4.00–12.00
Dysregulation	5.02 (1.67)	3.00–9.00
Coping	8.38 (2.17)	4.00–12.00
ERC		
Lability/negativity	27.11 (5.40)	15.00–46.00
Regulation	25.97 (2.84)	18.00–32.00
EESC		
Poor awareness	20.20 (6.59)	8.00–40.00
Expressive reluctance	21.72 (6.29)	8.00–38.00
CBCL		
Anxiety/depressed	54.67 (6.41)	41.00–76.00
Internalizing problems	51.06 (9.87)	33.00–74.00
Externalizing problems	49.85 (9.88)	33.00–76.00

divergent validity. The means, standard deviations, and ranges for each measure can be found in Table 3.

Emotion Measures

Emotion Regulation Checklist (ERC) The ERC (Shields and Cicchetti 1997) was administered to assess parents' perceptions of their children's emotion regulation ability. This 24-item questionnaire uses a 4-point Likert scale (1 = *Never*, 4 = *Always*) and is comprised of two scales. The Emotion Regulation scale assesses children's emotional self-awareness and the occurrence of constructive emotional expressivity (e.g., "responds positively to neutral or friendly overtures by peers"). The Lability/Negativity scale assesses mood lability and maladaptive affective displays (e.g., "exhibits wide mood swings"). The scales demonstrate strong internal consistency (.96 for Lability/Negativity, .83 for Regulation) and discriminant and construct validity (Shields and Cicchetti 1997). Internal consistency was also strong for the current sample (.91 for Lability/Negativity, .80 for Regulation).

We hypothesized that convergent validity for the CWMS would be established by several significant correlations with the ERC. Specifically, the CWMS Worry Dysregulation scale was expected to yield a positive relationship with the ERC Lability/Negativity scale and a negative correlation with the ERC Regulation Scale. A negative relationship was expected between the Worry Coping scale and the Lability/Negativity scale because high levels of adaptive worry coping were posited to be associated with lower parent reports of emotional lability and inappropriate displays of negative emotion. Likewise, a positive association between children's worry coping ability (CWMS Worry Coping) and adaptive emotion expressivity (ERC Regulation) was expected. Because of the conceptual difference between adaptive worry management assessed by the CWMS Inhibition scale and the ERC scales, no significant relations were anticipated.

Emotion Expression Scale for Children (EESC) The EESC (Penza-Clyve and Zeman 2002) is a 16-item child self-report questionnaire that was used to assess two aspects of maladaptive emotion expression. The EESC utilizes a 5-point Likert scale with scores ranging from 1 (*not at all true*) to 5 (*extremely true*) that yield two subscale scores: (a) Poor Awareness, impoverished awareness of own emotional state (e.g., "Sometimes I just don't have words to describe how I feel") and (b) Expressive Reluctance, the lack of motivation to express emotion to others (e.g., "I do not like to talk about how I feel"). Results from studies using a community sample (Penza-Clyve and Zeman 2002), an outpatient sample of adolescent girls with Bulimia Nervosa or Major Depression (Sim and Zeman 2004), and a psychiatric inpatient sample of adolescents with reports of deliberate self-harm (Sim et al. 2009), indicate that the reliability and validity of the EESC scales have been established with internal consistencies ranging from .81 to .88 for both scales across studies. Internal consistencies were .77 for the Poor Awareness factor and .83 for the Expressive Reluctance factor in the current sample.

Positive correlations between the CWMS Inhibition scale and the EESC Poor Awareness and Expressive Reluctance scales were expected given the conceptual overlap between factors. No associations were expected between the Worry Coping scale and the EESC scales. A positive correlation was also anticipated between dysregulated worry expression and lack of emotional awareness because research indicates that dysregulation is often the result of experiencing diffuse, numerous emotions that are perceived as indistinct (Sim and Zeman 2004).

Children's Sadness and Anger Management Scale (CSMS, CAMS) The 12-item CSMS (Zeman et al. 2001) and 11-item CAMS are self-report instruments designed to assess methods of regulating sadness and anger using a 3-point Likert scale (1 = *hardly ever*, 2 = *sometimes*, 3 = *often*). The CSMS and CAMS are each comprised of three subscales, Inhibition (e.g., "I'm afraid to show my anger"), Dysregulation (e.g., "I do things like slam doors when I am mad"), and Emotion Coping (e.g., "When I am

sad, I do something totally different until I calm down"). Initial validation on a sample of Caucasian, middle-class 4th and 5th grade children demonstrated construct validity, adequate alpha coefficients (.62 to .77), and good test–retest reliability (.61 to .80) on the subscales (Zeman et al. 2001). Subsequent studies using the CSMS and CAMS have yielded additional evidence of validity and reliability using samples of early elementary school age children (Cassano et al. 2007; McAuliffe et al. 2007), adolescents (Wills et al. 2006), African-American youth samples (Perry-Parrish and Zeman 2007), and children with psychiatric disorders (Sim and Zeman 2004, 2006). For the current sample, internal consistencies for the subscales from each instrument ranged from .63 to .83.

Although contemporary theories of emotion posit unique functional properties, physiological bases, developmental pathways, and behavioral expressions for discrete emotions (Campos et al. 1994; Izard 2009), some overlap among children's perceptions of their ability to manage a variety of emotions was expected. For example, positive correlations were expected between the Coping scales on the CSMS, CAMS, and CWMS, with more similarity between the management of sadness and worry than between anger and worry given the internalizing nature of sadness and worry. A similar pattern of findings was expected for the Inhibition and Dysregulation scales. In addition, because of the relationship between one's ability to maintain control over emotional behavior and the expression of emotion, negative correlations were expected between the Coping scale on the CWMS and the Dysregulated Expression scales on the CSMS and CAMS.

Behavior Problems

Child Behavior Checklist (CBCL) Parents completed the behavior problems portion of the CBCL (Achenbach and Rescorla 2001), a broad-based instrument design to assess children's internalizing and externalizing problems. The CBCL has 113 items rated on a 3-point scale (*not true, sometimes true, often true*) and yields three broad-band scales (i.e., Total Score, Internalizing Problems, Externalizing Problems) and eight syndrome scales (i.e., Anxiety/Depressed, Withdrawn/Depressed, Somatic Complaints, Social Problems, Thought Problems, Attention Problems, Rule-Breaking Behavior, and Aggressive Behavior). Validation studies using the CBCL indicates strong internal consistency, with values ranging from .78 to .97 with adequate content, criterion-related, and construct validity (Achenbach and Rescorla 2001).

To demonstrate convergent and divergent validity, the Anxious/Depressed subscale and Internalizing and Externalizing Problems summary scores were utilized. We hypothesized that the Inhibition and Dysregulation subscales would be positively correlated with the Anxious/Depressed and Internalizing scales. The Coping subscale was expected to be negatively related to the Anxious/Depressed and Internalizing scales. It was not anticipated that any of the three CWMS subscales would be significantly related to the Externalizing scale, thus, yielding evidence of divergent validity.

Results

Assessment of Validity

Evidence for convergent and divergent validity was established by examining correlations with other indices of emotion management and behavior: the EESC, ERC, CSMS, CAMS, and CBCL. Correlation matrices are shown in Tables 4 and 5.

Worry Inhibition Scale

Because initial analysis of the Worry Inhibition scale revealed significant gender differences such that girls reported significant higher levels of inhibited worry expression than boys, validity analyses were conducted separately for each gender. See Table 5 for the correlation

Table 4 Convergent and discriminant validity of the CWMS scales

Measures	Inhibition	Dysregulation	Coping
CWMS			
Inhibition	–	–	–
Dysregulation	−.24**	–	–
Coping	.01	−.09	–
ERC			
Lability/negativity	.04	.16*	−.24**
Regulation	−.13	−.08	.16*
EESC			
Poor awareness	.24*	.29***	.11
Expressive reluctance	.32***	.11	.01
CSMS			
Inhibition	.39***	−.02	.18*
Dysregulation	−.11	.55***	−.02
Coping	.01	−.19*	.36***
CAMS			
Inhibition	.24**	.03	.23*
Dysregulation	.10	.01	−.09
Coping	.06	−.13*	.39***
CBCL			
Anxiety/depressed	−.11	.19*	−.20*
Internalizing problems	−.19*	.17*	−.19*
Externalizing problems	−.06	.10	−.22*

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

Table 5 Convergent and discriminant validity of the worry inhibition scale by gender

Measures	Boys	Girls
ERC		
Lability/negativity	.11	−.04
Regulation	−.29*	.01
EESC		
Poor awareness	−.02	.31**
Expressive reluctance	.08	.38***
CSMS		
Inhibition	.30**	.47***
Dysregulation	−.16	−.03
Coping	−.06	.09
CAMS		
Inhibition	.03	.40***
Dysregulation	.12	.03
Coping	−.12	.16
CBCL		
Anxiety/depressed	−.14	−.15
Internalizing problems	−.24*	−.12
Externalizing problems	.05	−.10

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

matrix. Interestingly, a significant negative correlation emerged between the Worry Inhibition scale and the ERC Emotion Regulation scale for boys but not for girls. Specifically, boys who acknowledged higher levels of inhibited worry expression had parents who indicated that their sons had less adaptive emotion regulation skills ($r^2 = .08$). Consistent with our hypotheses, Worry Inhibition was positively correlated with the EESC Poor Awareness and Expressive Reluctance scales, although these associations were significant only for girls. Specifically, girls' self-reported worry inhibition was significantly associated with poor awareness of emotional cues and situations ($r^2 = .10$) and the reluctance to express negative emotions ($r^2 = .14$).

For girls, the Worry Inhibition scale was also positively correlated with other CEMS indices of inhibited emotional expression. Specifically, positive correlations were obtained between the Worry Inhibition scale and the Sadness Inhibition scale from the CSMS and the Anger Inhibition scale from the CAMS. Only the correlation between the Worry and Sadness Inhibition scales was significant for boys. That is, girls' and boys' self-reported inhibition of worry were positively associated with the inhibited expression of sadness ($r^2 = .22$ and $r^2 = .09$, respectively), and girls' inhibited worry was also positively associated with the inhibition of anger ($r^2 = .16$).

For boys only, the Worry Inhibition scale was unexpectedly negatively correlated with the Internalizing Problems summary scale on the CBCL such that higher self-reported inhibition of worry by boys was associated with parent-reported lower incidence of internalizing symptoms in their sons ($r^2 = .06$).

Worry Dysregulation Scale

For the ERC scales, a significant positive correlation was found between Worry Dysregulation and ERC Lability/Negativity ($r^2 = .03$). Contrary to our predictions, Worry Dysregulation was not related to parent ratings on the ERC Emotion Regulation scale. As predicted for the EESC scales, a positive correlation emerged when comparing the Worry Dysregulation scale and the Poor Awareness factor ($r^2 = .08$). Correlations between the Worry Dysregulation scale and indices of sadness and anger dysregulation on the CSMS and CAMS yielded several significant associations. Consistent with our predictions, children's self-reported non-constructive management of worry was positively correlated with their self-report of sadness dysregulation ($r^2 = .30$) but not with anger dysregulation. Additionally, self-reported worry dysregulation was negatively associated with sadness coping ($r^2 = .04$) and anger coping ($r^2 = .02$). Regarding measures of internalizing and externalizing symptoms, the Dysregulation scale was positively correlated with the Anxiety/Depressed syndrome scale ($r^2 = .04$) and the Internalizing Problems summary scale on the CBCL ($r^2 = .03$).

Worry Coping Scale

As predicted, correlations between the Worry Coping scale and the ERC scales yielded a negative association with the Lability/Negativity scale ($r^2 = .06$) and a positive correlation with the Emotion Regulation scale ($r^2 = .03$). Consistent with our hypotheses, children's self-reported ability to cope with worry was positively associated with their ability to also cope with sadness ($r^2 = .13$) and anger ($r^2 = .15$). In addition, positive correlations were obtained between the Worry Coping scale and the Sadness Inhibition scale from the CSMS ($r^2 = .03$) and the Anger Inhibition scale from the CAMS ($r^2 = .05$). The Coping scale was negatively correlated with the Anxiety/Depressed ($r^2 = .04$), the Internalizing Problems ($r^2 = .04$), and Externalizing Problems scales on the CBCL ($r^2 = .05$).

Discussion

Overall, the results provide a promising set of preliminary findings to indicate that the CWMS can assess aspects of worry management in children in a reliable and valid manner. The reliability indices and the emerging evidence of convergent and divergent validity for the three CWMS

scales provide a foundation from which future research can build.

The Inhibition scale provided interesting findings with respect to the influence of gender on worry expression. Somewhat surprisingly, girls reported inhibiting their worry more than boys, which is inconsistent with gender stereotypes in which girls are thought to express internalizing types of emotions (e.g., sadness, worry) more than boys due to socialization pressures that include a priority on relational rather than instrumental goals (Cassano et al. 2007; Parker and Gottman 1989; Zeman and Shipman 1997). When examining the patterns of associations with measures of validity, an intriguing set of gender differences emerged as well. Girls' worry inhibition was strongly related to lack of awareness of internal emotional states, the difficulty in expressing emotion to others, and to sadness and anger inhibition. Thus, it seems as if certain girls may adopt an overall inhibitory style of emotional expression that does not differentiate between type of emotion.

In contrast, the pattern of associations to boys' endorsement of worry inhibition differed from that of the girls' patterns of correlations except for one overlap; boys who endorsed higher levels of worry inhibition also reported inhibiting their sadness but not anger expression. Research has indicated that boys and girls have different expression rules for anger that permit more acceptable direct expression of anger for boys than girls (see Zeman et al. 2006, for a review). However, several important gender differences in inhibition arose. Specifically, boys who reported inhibiting their expression of worry had parents who rated them as having more difficulties with constructive emotional expression. It may be that boys who do not express their worries directly may communicate these concerns in other dysregulated ways. Interestingly, parents of boys who rated themselves as frequently inhibiting their worry saw these boys as having few internalizing behavior problems. It may be that these boys are so effective at masking their worry that their parents are unaware that they may be experiencing internalizing types of problems. Finally, it could be that boys who manage their worry by "hiding it" may have discovered a coping strategy that protects them from experiencing other internalizing types of symptomatology. It could be that *not* talking about worry serves an adaptive function if it helps the worry to dissipate. Future research needs to better understand whether the worry inhibitory style is advantageous for boys with respect to psychological functioning.

Regarding the Worry Dysregulation scale, the findings indicated a cohesive pattern in anticipated directions. That is, children who reported higher levels of unacceptable worry behavior also reported having difficulties managing their sadness but not anger behaviors. Further, dysregulation of worry expression was also inversely related to sadness and anger coping and positively related parent report of symptoms of anxiety and depression and overall internalizing difficulties. Further, it appears that worry dysregulation is strongly associated with lack of emotional awareness which may be the underlying skill deficit that leads to poor coping with worry in the form of dysregulated expression. The hallmark of many psychological disorders is the presence of dysregulated affect (Bradley 2000) and the Worry Dysregulation scale provides additional empirical support for this tenet with elementary school-age children.

The Worry Coping scale also provided a clear pattern of findings that is consistent with research indicating that adaptive methods of coping with negative emotion are fundamentally linked to psychosocial adaptation (Bradley 2000; Cicchetti et al. 1995; Cole et al. 1994). That is, constructive ways of responding to worry were inversely related to parent-rated internalizing and externalizing problems. Not surprisingly, children who reported using constructive coping behaviors also reported coping adaptively to sadness and anger. It may be that children develop general emotion regulation coping strategies that transcend emotion type or they flexibly tailor their general coping strategies to respond to the unique challenges presented by different emotional contexts. An unexpected finding was the positive relationship between the Coping and the Inhibition scales. This association may reflect an underlying common element of effortful control that is implicated in effective emotion regulation efforts (Eisenberg et al. 2004). It may also be that children in this study viewed inhibition as a way to prevent negative consequences of overtly expressing worry.

Study 2

The goal of Study 2 was to provide evidence of discriminant validity for the CWMS by demonstrating that the subscales differentiated between a group of anxiety disordered children and those with no psychiatric diagnoses.

Method

Participants

Participants were 54 children, 31 girls (M age = 10 years, 11 months, SD = 17 months) and 23 boys (M age = 10 years, 3 months, SD = 12 months), and their mother recruited from public elementary schools serving a primarily rural, working class, Caucasian population. All children were Caucasian and families were generally rated in the middle socioeconomic status range based on the Hollingshead Four Factor Index of Social Status

(Hollingshead, 1975, unpublished manuscript). Regarding family constellation, the majority of children lived with both biological parents (72.9%), with the remainder of children living with their mother only (17.3%) or their mother and stepfather (9.8%).

Children with parental/guardian permission to participate were contacted by phone for the initial screening to determine whether they met the study criteria. Details of the screening and recruitment of participants can be found in Suveg and Zeman (2004). In short, children were initially screened in the public school system for anxiety symptoms using the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds and Richmond 1978, 1985). Parents of children who scored in the clinical range on anxiety were called to conduct a more in depth phone screening. If the phone screening determined that the children were likely to meet criteria for an anxiety diagnosis, an assessment was scheduled. During the assessment, all children and parents were administered the ADIS-IV.

Based on the Anxiety Disorder Interview Schedule for Children—Fourth Edition (ADIS-IV)—Child/Parent Versions (Albano and Silverman 1996), 27 children were diagnosed with the following principal diagnoses: Generalized Anxiety Disorder (girls = 5, boys = 5), Separation Anxiety Disorder (girls = 4, boys = 5), and Social Phobia (girls = 7, boys = 1).The majority of children in the sample also had a comorbid anxiety disorder (girls = 9, boys = 8) and to a lesser extent, a comorbid externalizing disorder (i.e., Oppositional Defiant Disorder, Attention-Deficit Hyperactivity Disorder) (girls = 2, boys = 3). The control group ($N = 27$; girls = 15, boys = 12) was recruited from schools from the same geographic region and was matched based on age and gender. Based on the ADIS-IV interviews, these children did not meet criteria for a psychiatric disorder of any kind.

Procedure

Children and their mothers were administered the CWMS, the ADIS-IV, and other questionnaires during a home visit by a doctoral candidate in clinical psychology. The questionnaires completed during these visits were part of a battery of questionnaires from larger research projects (Suveg and Zeman 2004; Suveg et al. 2005). All families received monetary reimbursement and a small token (e.g., folder) for participating.

Measures

Anxiety Disorders Interview Schedule for DSM-IV, Child and Parent Versions (ADIS-IV; Albano and Silverman 1996). The ADIS-IV Child and Parent versions are semi-structured interviews that assess for the presence of symptoms associated with anxiety disorders according to the Diagnostic and Statistical Manual of Mental Disorders DSM-IV criteria (American Psychiatric Association 1994). The interviews involve a thorough account of symptoms, course, and degree of functional impairment associated with specific classes of anxiety disorders in addition to non-anxiety DSM-IV disorders. A composite diagnosis is achieved using child and parent data. The ADIS-IV Child and Parent versions have demonstrated adequate reliability and validity (Albano and Silverman 1996; Silverman and Nelles 1988; Silverman et al. 2001). Diagnostic reliability was established for this study by having an advanced graduate student rate approximately 1/3 of randomly selected audio-taped interviews (kappa for principal diagnosis = .89). This student was unaware of the diagnostic status of the child.

Results

To demonstrate the ability of the CWMS to discriminate between children with and without an anxiety disorder regarding the management of worry, an independent samples *t*-test was conducted for each CWMS subscale.

No significant findings emerged for the Inhibition scale. For the Dysregulation subscale, children diagnosed with an anxiety disorder ($M = 5.85$, SD = 2.58) reported higher levels of dysregulation compared to the non-anxious group, ($M = 4.37$, SD = 1.36), $t(52) = 2.64$, $p < .05$. For the Coping scale, the anxious group ($M = 6.04$, SD = 1.19) reported lower levels of worry coping abilities compared to the non-anxious group, ($M = 6.78$, SD = 1.34), $t(52) = 2.15$, $p < .05$.

Discussion

The results of Study 1 provided initial reliability and validity indices for the CWMS; the second study added further empirical support for the scale by demonstrating its ability to differentiate between non-clinical and clinically anxious groups of children. Not surprisingly, children with anxiety disorders reported more dysregulated worry expression than did children without anxiety disorders. Indeed, children with anxiety disorders often evidence behavioral difficulties, particularly in the face of an anxiety-provoking/worry situation (Kendall and Suveg 2006). For example, a child with significant separation anxiety may scream, cry, and hold on to his or her parent in an effort to prevent separation. Similarly, a child who is socially anxious, and forced to attend an event with peers, may likewise "carry on" and refuse to go. In fact, one diagnostic criterion for many of the anxiety disorders is that the child display distress in the face of the feared stimuli and in some cases, refuse exposure. Refusing to

face a fear, in the case of the child, often manifests itself as externalizing types of behaviors. Inspection of the individual items of the Dysregulation scale is consistent with this notion (e.g., "I do things like cry and carry on when I'm worried," "I can't stop myself from acting really worried.").

Similar findings as the Dysregulation subscale emerged for the Coping subscale in that children with anxiety disorders reported less adaptive coping with worry than did non-anxious children. This finding provides validity for the Coping subscale given that an inability to adaptively manage worry is a diagnostic criterion for Generalized Anxiety Disorder (APA 2000) and is a characteristic feature of many other anxiety disorders as well. Individual items on the Coping subscale such as "I try to calmly settle the problem when I feel worried" are in contrast to behavior that is characteristic of anxiety (Barrios and Hartmann 1997). Thus, the ability of the CWMS to discriminate between children with and without anxiety disorders, particularly with respect to the Regulation Coping scale, is an indication of the utility of this subscale.

The lack of group findings on the Inhibition subscale initially may seem counter-intuitive, yet there are several possible explanations. Challenging the notion that children with an anxiety disorder exhibit inhibition to the neglect of other behaviors, it may be that withdrawn or inhibited behavior is a characteristic of *some* children with anxiety disorders in *some* situations, but may not be a universal sign of anxiety disorders. For example, a socially anxious youth may appear socially inhibited when faced with peer interaction but a separation anxious youth may appear dysregulated upon separation from his or her parent. The variability evidenced in inhibition across children with anxiety disorders might explain the lack of group discrimination on this variable. Future research should further investigate this intriguing finding.

Other evidence for the validity of the CWMS emerges from recent research that used a sample of 104 children (65 girls) from ages 6–17 years who all were diagnosed with an anxiety disorder using the ADIS-C/P (Trosper and Ehrenreich 2007). Children completed the CWMS and other anxiety questionnaires (i.e., *Multidimensional Anxiety Scale for Children* (MASC), March et al. 1997; the *Penn State Worry Questionnaire for Children (*PSWQ-C), Chorpita et al. 1997). Correlational analyses indicated significant positive correlations between the Inhibition scale and Anxiety Disorders Index (ADI) of the MASC ($r = .23$) and the PSWQ-C ($r = .23$), significant positive correlations between the Dysregulation scale and the MASC-ADI ($r = .44$) and the PSWQ-C ($r = .43$), and significant negative correlations between the Coping scale and MASC-ADI ($r = -.25$) and the PSWQ-C ($r = -.41$). Thus, these results provide evidence for convergent validity with other measures of clinical worry but also indicate that the CWMS provides a unique assessment of the ways in which children report managing their worries that is distinct from the other worry questionnaires based on the weak to moderate strengths of the various correlations.

General Discussion

The goal of our study was to (a) construct a brief scale to assess children's methods of managing their worry, and (b) add a validated scale to a meager collection of instruments that assess children's emotion regulation strategies. Using child- and parent-report, the results of the first study indicated that the CWMS has adequate psychometric properties that provide preliminary evidence for the reliability and validity of the scale. The second study used a clinical sample of children with anxiety disorders and a comparison group to provide evidence of the CWMS's ability to discriminate between normal and pathological levels of worry. Collectively, the studies provide evidence that the CWMS has potential for use in both research and clinical contexts. For research purposes, the measure efficiently yields information on three diverse methods of worry management with little expenditure in participant time and energy. Clinically, this is the first instrument that assesses *how* children perceive managing their worry experiences. It may be able to be used to screen for maladaptive worry regulation and perhaps to help identify intervention targets. Given the brevity of the CWMS, repeated administrations of this questionnaire will not tax the child and clinicians can also use it to measure intervention change.

Integrating the findings across both studies, it appears that some level of worry inhibition characterizes both samples and does not differentiate between clinically anxious and non-anxious children. It may be that worry inhibition and worry coping skills both require the common element of effortful control that is broadly implicated as essential to effective emotion regulation skills (Eisenberg et al. 2004). Thus, it may be that a low level of worry dampening may be normative and not predictive of clinically significant anxiety. However, higher levels of inhibition of worry do appear to be related to more anxious symptoms (Trosper and Ehrenreich 2007). Future research needs to examine under what conditions the inhibition of worry is functional and adaptive and what factors tip the scale in the other direction.

In contrast to the inhibition method of management, dysregulated expressions of worry appear to robustly differentiate between clinical and non-clinical groups of anxious children and are correlated with negative psychological outcomes and other indices of poor emotional competence

in a community sample. Thus, expressing worry in overt, excessive, behavioral ways (e.g., whining, crying) may be "functional" in the sense that these behaviors signal to others in the social environment that assistance is needed with regulatory efforts. However, the emotion behaviors that are displayed may not clearly signal to others that worry is the root of the upset but rather these behaviors may be interpreted as indicating other internalizing and/or externalizing behavior problems (Kendall and Suveg 2006).

Although the CWMS addresses a gap in the worry assessment literature and represents an additional step in the process of developing an emotion management battery of questionnaires, there are a few notable limitations that restrict its generalizability. First, the CWMS was developed using a middle-class, Caucasian sample. It is not known whether the norms from this sample would generalize to other cultures that are more heterogeneous in nature. Second, the range of ages used in the studies was from 6 to 12 years of age. Thus, additional research is needed to provide norms that would apply to an adolescent population. Third, although the sample size of Study 1 was adequate for conducting an exploratory factor analysis (Arrindell and van der Ende 1985), the clinical and non-clinical samples in Study 2 were not large enough to conduct Confirmatory Factor Analysis and may also limit generalizability. Future studies are needed to explore structural validity. Fourth, although one of the advantages of the measure is its brevity, this was obtained at the potential cost of lowered reliability indices. Because the scale has a relatively low variable-to-factor ratio (3.33), aberrant responses to one item may negatively impact the reliability of subscale scores. Nonetheless, given the goal of creating a feasible self-report instrument for young children, it was desirable to keep the CWMS as brief as possible. Additional research is needed to examine ways to maximize reliability and validity of self-report instruments for children (e.g., reading items and responses aloud, verbally confirming the meaning of children's responses to each item).

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