Measurement of Panic Interpretation Bias Using the Anxiety Interpretation Questionnaire for Children

Silvia Schneider, PhD
Tina In-Albon, lic. phil.
Uwe Rose, PhD
Federal Institute for Occupational Safety and Health
Berlin, Germany

Jill T. Ehrenreich, PhD
Center for Anxiety and Related Disorders at Boston University
Boston, MA

The purpose of the present study is to investigate the development of a reliable and valid measure for the assessment of panic-relevant interpretations in children. The resulting measure, the Anxiety Interpretation Questionnaire for Children (AIQ-C), presents descriptions of panic-relevant and panic-irrelevant ambiguous scenarios along with several possible interpretations of these scenarios. Child participants are also asked to rate their agreement with various strategies for coping. First, we investigated content validity of this measure by asking a group of experts to rate the relevance of the scenario interpretations. In a second step, reliability and validity of this measure was investigated utilizing a sample of 143 children. In this investigation, the AIQ-C demonstrated good construct, convergent, and discriminate validity as well as adequate internal consistency. The results of this study indicate that the AIQ-C appears to be a reliable and valid measure for the assessment of bodily sensation interpretations associated with panic in children.

Keywords: interpretation bias in children; cognitive bias; panic disorder; Anxiety Interpretation Questionnaire for Children

Cognitive and psychophysiological models of panic disorder (PD) have emphasized the role of an interpretation bias in the maintenance of this disorder (Beck, Emery, & Greenberg, 1985; Clark, 1986, 1988; Margraf & Ehlers, 1989). Specifically, these models postulate that individuals with PD interpret body sensations associated with panic as threatening and that this interpretation, in turn, helps to produce panic attacks and facilitates the maintenance of PD over time. The presence of this type of interpretation bias has been well documented among adults with PD (Butler & Mathews, 1983; Clark et al., 1997; Harvey, Richards, Dziadosz, & Swindell, 1993; Kamieniecki, Wade, & Tsourtos, 1997; McNally & Foa, 1987; Richards, Austin, & Alvarenga, 2001). Notably, most of these studies used questionnaire measures to assess interpretation biases based

on McNally and Foa's (1987) Interpretation Questionnaire (a modified version of another questionnaire, originally developed by Butler and Mathews [1983]). The results of these studies generally support the hypothesis that PD is associated with a negative interpretation bias of panic-relevant body sensations in adults.

In a previous investigation by Schneider, Unnewehr, Florin, and Margraf (2002) of the frequency of panic-related interpretations in children of parents with PD, a group of children identified as being at risk for the development of anxiety disorders was examined through the use of a new panic interpretation questionnaire, developed especially for the study. This study found that children of parents with PD display a similar interpretation style to that of their parents after priming for threatening interpretations. Significantly, children demonstrated this interpretative style in the absence of any history of panic attacks, giving rise to the possibility that this bias may be viewed as a possible vulnerability factor for later development of PD. Accordingly, it seems that a panic interpretation bias is not only important to the maintenance of PD, but in consideration of this disorder's etiology as well.

Research on similar interpretation biases in children with anxiety disorders has only recently begun. Initial studies in this area demonstrate that children with anxiety disorders and highly anxious children appear to show interpretation biases in regard to ambiguously threatening scenarios similar to their adult counterparts (Barrett, Rappee, Dadds, & Ryan, 1996; Bögels & Zigterman, 2000; Chorpita, Albano, & Barlow, 1996). Children appear to demonstrate a higher likelihood of interpreting an ambiguous situation as threatening compared to other children their age. Investigations by Barrett and associates (1996) and Chorpita and associates (1996) have demonstrated that such an interpretation bias is also frequently associated with children's selection of avoidant coping strategies. Therefore, these studies have provided initial indications that the investigation of interpretation bias is important for the understanding of anxiety disorders in general, both in children and adults.

However, some investigators have noted particular concern with the measures used to assess interpretation bias in these studies. None of the studies with children and only a few of the adult studies cited above systematically investigated the psychometric properties of the questionnaires or other measures of interpretation bias utilized in their studies (e.g., Clark et al., 1997; Kamieniecki et al., 1997). Furthermore, Cox (1996) and Austin and Richards (2001) both highlighted inconsistencies and limitations among current studies of PD-related misinterpretations of ambiguous situations. For instance, Cox cautioned against focusing only on negative or catastrophic interpretations as response possibilities in ambiguous scenarios. This is particularly relevant for cognitive assessment measures that might be utilized in treatment outcome investigations, because treatment for PD typically aims to not only eliminate catastrophic cognitions, but also to increase positive cognitions. Austin and Richards also indicate that whereas cognitive models of PD emphasize the immediate nature of catastrophic misinterpretations of situations, the questionnaires by Clark and associates (1997) and Richards and associates (2001) do not make reference to the immediacy of such cognitions. The inclusion of an immediacy dimension in measures of interpretation bias would, therefore, seem appropriate. The validity of these instruments would also be improved by including items related to all of the symptoms referenced in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.) (American Psychiatric Association, 1994) panic attack criteria. Furthermore, to be more consistent with cognitive models on this subject, it is necessary to understand more clearly possible anxiety-related and harm-related response choices that may follow catastrophic cognitions about physiological symptoms. Therefore, participants should be asked to indicate what they believe is likely to happen following their initial interpretations of an event, and to rate how unpleasant they find these outcomes. As an additional note, it is important to recognize that our understanding of how to measure catastrophic misinterpretations may be limited by the fundamental lack of adequate tests to assess this concept.

The purpose of the present study is to develop and test the utility of a reliable and valid measure for the assessment of panic-relevant interpretations for children and adolescents. To investigate

possible interpretations of panic-relevant stimuli in children we developed the Anxiety Interpretation Questionnaire for Children (AIQ-C), which was modeled after questionnaires previously developed to investigate this topic, including those by McNally and Foa (1987), Clark and associates (1997), and Schneider et al. (2002), along with additional theoretically derived changes, as suggested by Cox (1996).

METHOD

Psychometric properties of the AIQ-C were investigated in two related studies. In the first study, 20 experienced clinical psychologists rated the fit of interpretation possibilities corresponding to ambiguous scenarios contained in the measure to either panic-related or alternative interpretation categories. In a second study, the reliability and validity of this measure was established using the questionnaire with 143 school children between the ages of 9–14 years.

Instruments

Anxiety Interpretation Questionnaire for Children (AIQ-C). The questionnaire consists of 16 ambiguous scenarios constructed to be *either* panic-relevant, *or* related to symptoms of a cold or similar illness. The panic-relevant ambiguous scenarios presented make reference to the immediate occurrence of bodily sensations, such as heart pounding, shortness of breath, sweating, and flushing. Symptoms such as head congestion or pain, a hot forehead, generally feeling bad, and exhaustion constituted the stimuli presented in cold-related scenarios. These stimuli were construed as panic-irrelevant bodily sensations and their inclusion may help to clarify, in future investigations, whether children with PD interpret all somatic sensations or only panic-relevant physical sensations as dangerous. The symptoms used were chosen from former studies in which children (aged 9–16) were asked to indicate typical panic and typical cold symptoms (Schneider & Hensdiek, 2003; Walter, 2000). For all panic symptoms, the immediate character of panic (see Austin & Richards, 2001) was emphasized by including words or phrases such as "suddenly" and "all at once" in the panic-relevant scenarios. After each scenario, three alternative interpretations (panic, neutral, and positive *or* cold-related) were presented. Although the potential interpretations in the anxiety interpretation questionnaire by Schneider and associates (2002) included a mixture of emotions and cognitions (e.g., "Lena is afraid and thinks she is sick."), the present study utilized more simplified, unidimensional threat interpretations (e.g., "I am seriously ill."). This change is supported by the work of Austin and Richards (2001), who suggest separating cognitive from emotional reactions when constructing possible interpretation choices. For each possible interpretation of a scenario, the child completing this questionnaire is asked to give a rating on a 4-point scale indicating one's agreement with each interpretation (1 = no agreement; 2 = agree somewhat; 3 = mostly agree; 4 = totally agree). Analogous to the measure used by Barrett and associates (1996), participants were also asked how they would cope with the situations presented. For each coping strategy listed, a rating of agreement with each particular strategy using the same scale is also given by child participants. The following are examples from both the panic-relevant and cold-related categories of the 16 ambiguous scenarios presented (a total of 8 situations comprise each category).

Example of a Panic Scenario

"I am at the bus stop. Suddenly my heart is pounding and I am short of breath. What is happening?"

Interpretation Choices:

Panic: I am seriously ill.

Neutral: I am in a hurry.

Positive: I am going to a big birthday party right now.

Coping Strategy Choices (in response to the question "What are you going to do next?"):

Passive: I am not going to do anything.

Avoidance: I am going to run away to a safe place.

Distraction: I will distract myself somehow.

Calming: I will try to calm myself down.

Example of a Cold-Related Scenario:
"I am with a friend. I'm feeling bad and my head hurts. What is happening?"
Interpretation Choices:

Panic: I am seriously ill.

Neutral: I played too hard or too long with my friend.

Cold: I have a cold.

Coping Strategy Choices (in response to the question "What are you going to do next?"):

Passive: I am not going to do anything.

Avoidance: I am going to run away to a safe place.

Distraction: I will distract myself somehow.

Calming: I will try to calm myself down.

As noted, interpretations that construe the situation as most dangerous were taken to reflect *panic*; interpretations that focus on exhaustion or a lack of interest in a situation are construed as *neutral*; and positively valenced explanations were construed as *positive*. In the case of cold-related ambiguous scenarios, a cold-relevant interpretation replaced overtly positive interpretations as the third response choice. This cold-relevant interpretation may, however, be construed as positive in the sense that it was a nonthreatening and plausible interpretation of the cold symptoms, if not positive in valence. Therefore, the AIQ-C responses may be scored in such as way as to produce six scales with 8 items on each scale: Panic-relevant situations with panic interpretations (PA-PA); panic-relevant situations with neutral interpretations (PA-NE); panic-relevant situations with positive interpretations (PA-PO); cold-relevant situations with panic interpretations (CO-PA); cold-relevant situations with neutral interpretations (CO-NE); and cold-relevant situations with cold interpretations (CO-CO).

Other Questionnaires.   The Childhood Anxiety Sensitivity Index (CASI) (Silverman, Fleisig, Rabian, & Peterson, 1991) was administered to assess the construct validity of the AIQ-C. The CASI is an 18-item questionnaire assessing the fear of anxiety symptoms in children on a 3-point Likert scale ranging from 1 (never) to 3 (often). Internal consistency of the German version (Schneider & Hensdiek, 1994) has ranged from .80 and .85. For children with a normative range of anxiety, the test-retest reliability was .80 in a German sample. Although higher levels of both anxiety sensitivity and interpretation bias may be conceptualized as risk factors for the development of anxiety disorders, they are not thought to represent the same construct. High anxiety sensitivity is defined by the belief that anxiety-related sensations are indicative of harmful physiological, psychological, or social consequences (Reiss & McNally, 1985). In contrast, an interpretation bias can be viewed as a distortion in the information processing sequence in which there is a tendency to misinterpret bodily sensations as more threatening than they have the probability of being. In line with the discrepancy between these two constructs, assessment of these variables may be viewed as distinct. For instance, whereas the CASI measures the degree to which an individual is concerned about possible negative consequences of arousal symptoms in a straightforward manner (e.g., "It scares me when I feel shaky." "Funny feelings in my body scare me."), the AIQ-C presents ambiguous scenarios, along with several alternative interpretations for a child to evaluate.

The Trait Scale of the State Trait Anxiety Inventory for Children (STAIC-T) (Spielberger, Gorsuch, & Lushenek, 1970) was also utilized to evaluate the construct validity of the AIQ-C.

The STAIC-T contains 20 items that have to be rated on a 3-point scale (1 = almost never; 2 = sometimes; 3 = often). Children using this measure are instructed to rate the frequency with which they experience anxiety symptoms in general. Internal consistency of the German version (Unnewehr, Schneider, & Margraf, 1990) was high (α = .83) and test-retest reliability was acceptable (.64) (Schneider, 1995).

Participants

In the first study, twenty clinical psychologists and clinical psychologists in training (15 female, 5 male) participated in evaluating the situations presented in the AIQ-C. The mean age of the psychologists was 34.7 years with a range of from 25 to 48 years. Thirty-five percent of these expert raters were fully trained as cognitively oriented psychotherapists, and 50% were in training for cognitive psychotherapy. The information of 3 participants (15%) was missing. The sample for the second study consisted of 143 children (70 girls, 73 boys) between 9 and 14 years of age (M = 11.57, SD = 1.68). Comparable numbers of children were represented across all ages included in the sample. The children participating in this investigation were recruited from different schools in Basel, Switzerland, and the surrounding region, with no stated stipulation that participating children would receive any clinical services as a result of their assistance with this investigation. No monetary compensation was paid to children or their families for participation, but a small, age-appropriate gift was provided to the children as thanks for their cooperation.

Procedure

Establishing content validity requires a set of judges who assess the degree to which selected items are representative of some defined domain of content (Hambleton & Rogers, 1990). Therefore, for the AIQ-C, the authors defined four categories a priori, along with their corresponding interpretation items, in order to specify the particular areas of content represented in this measure. These categories were labeled: (a) panic-relevant, (b) neutral, (c) positive, and (d) cold-related interpretations of a situation. In the first study, experts rated, on a 4-point scale, how well the constructed interpretation items fit the proposed panic, neutral, positive and cold-related scales. In the second study, the questionnaire was first piloted with 2 children (2 boys; ages 10 and 11) to assess its basic readability and child-friendliness, after which adaptations were made as necessary. Next, the sample of 143 children was asked to complete the AIQ-C, along with the STAIC-T and the CASI. A brief questionnaire was also given to obtain demographic characteristics of participating children, such as age, gender, and general school performance. The questionnaires were accomplished during regular classes and were all administered in German. The second author was present to provide technical assistance to the children if necessary and to ensure independent responding.

RESULTS

To analyze content validity in the first study, a procedure developed by Rose (2000) was used to establish the validity of AIQ-C test items. Following this procedure, the expert raters (n = 20) were asked to assign the 48 original measure items to four categories, representing each of the content domains. A resulting grid with 192 cells served as the basis for a concordance analysis, in accordance with a procedure introduced by Fleiss (1971). The degree of item representativeness was then judged by examining an index (i.e., κ) of both overall agreement and agreement within category. In addition, the experts also rated the perceived match between the four domain definitions and the content of each test item utilizing a Likert scale with fixed points ranging from 1 ("doesn't fit at all") to 4 ("completely fits").

For the second study, descriptive statistics, correlations between scales, and corrected item-total correlations were conducted. The internal consistency of the instrument was also assessed

using Cronbach's alpha. Moreover, to further examine the structure of the AIQ-C, a principal components analysis with varimax rotation was selected. In an initial attempt to examine the construct validity of this instrument, convergent and divergent associations between the AIQ-C, CASI, and STAIC-T were examined. Partial correlation coefficients were calculated to examine the unique relationship of the STAIC-T (and CASI, respectively) to the AIQ-C while controlling for the influence of the CASI (and STAIC-T). Correlation coefficients were calculated to explore the associations between the levels of agreement with interpretation choices and coping strategies.

Study I

The results of the content validity assessment are reported in Table 1. This table reports the mean percentage agreement between raters in the various item categories and kappa values for each category of AIQ-C items. Interrater agreement between expert raters was generally high, with mean percentage agreement between 89–96% across categories and kappa values in the range of .87–.95.

Study II

Reliability. The means, standard deviations, corrected item-total correlation and internal consistency ratings for the different scales of the AIQ-C are presented in Table 2. With the exception of one scale, all values obtained for corrected item-total correlations were above .5. The results supported generally good internal consistency for each of the six scales delineated in the AIQ-C. Values of Cronbach's alpha for the various scales were between .74 and .89. Item analysis did not indicate that elimination of items would lead to substantially higher internal consistency values.

Principal Components Analysis. For the panic-relevant items, a 3-factor solution was observed, accounting for 46.2% of the AIQ-C variance. The first factor, comprising items from the PA-PO scale, described 18.0% of the AIQ-C variance and contained all 8 items from this scale, with factor loadings of 0.42 or higher. The second factor included items from the PA-PA scale and accounted for 16.8% of the AIQ-C variance, using all 8 items, with factor loadings of

TABLE 1. INTERRATER AGREEMENT ACROSS MEAN PERCENTAGE AND KAPPA

N = 20	%	κ
Panic-relevant items	92%	.89
Neutral items	94%	.91
Positive items	89%	.87
Cold-relevant items	96%	.95

TABLE 2. MEANS, STANDARD DEVIATIONS, CORRECTED ITEM-TOTAL CORRELATION, AND INTERNAL CONSISTENCY FOR EACH SCALE OF THE AIQ-C

n = 143	M	SD	Corrected Item-Total r	Cronbach's α
PA-PA[a]	2.82	.73	.60	.85
PA-NE[b]	2.62	.62	.59	.74
PA-PO[c]	3.20	.75	.46	.87
CO-PA[d]	2.79	.76	.61	.89
CO-NE[e]	2.64	.63	.61	.78
CO-CO[f]	2.72	.74	.51	.88

Note. [a]Panic-relevant situations with panic interpretation. [b]Panic-relevant situations with neutral interpretation. [c]Panic-relevant situations with positive interpretation. [d]Cold-relevant situations with panic interpretation. [e]Cold-relevant situations with neutral interpretation. [f]Cold-relevant situations with cold interpretation.

0.32 or higher. The third factor accounted for 11.4% of the questionnaire's variance, and contained 6 of the 8 items from the PA-NE scale, each with factor loadings of 0.34 or higher. The rotated factor loadings, communalities, and eigenvalues of panic-relevant items in this factor solution are reported in Table 3.

A 3-factor solution was also found for cold-relevant items, accounting for 48.7% of the variance in the AIQ-C. The first factor included items from the CO-PA scale, described 19.8% of the variance, and contained all 8 items, with loadings of 0.51 or higher. The second factor accounted for 18.6% of the variance, and included all 8 items from the CO-CO scale, with factor loadings of 0.46 or higher. The third factor represented the CO-NE scale and explained 10.3% of the variance. Six of the 8 items from this scale were included in this third factor, with loadings of 0.33 or higher. The rotated factor loadings, communalities, and eigenvalues of cold-relevant items are included in Table 4.

Correlations With Other Measures. Construct validity was investigated by computing the correlations between AIQ-C, CASI, and STAIC-T. Generally speaking, significant positive correlation between the PA-PA and CO-PA scales of the AIQ-C and the CASI would support their convergent validity. The results of this analysis are reported in Table 5. The correlation between the PA-PA scale and the total score on the CASI was .55 ($p < .01$), and the correlation between

TABLE 3. Rotated Factor Loadings of Panic-Relevant Items (Only Factor Loadings Greater Than 0.30), Communalities, Eigenvalues, and Variance Accounted for by Factors

	Factor Labels			
	1	2	3	Com.
PA-PO	0.81			.70
PA-PO	0.79			.68
PA-PO	0.79			.70
PA-PO	0.77			.66
PA-PO	0.73			.63
PA-PO	0.70			.62
PA-PO	0.57			.53
PA-PO	0.42			.61
PA-PA		0.80		.73
PA-PA		0.77		.66
PA-PA		0.74		.69
PA-PA		0.72		.69
PA-PA		0.70		.64
PA-PA		0.67		.73
PA-PA		0.64		.62
PA-PA		0.32		.49
PA-NE			0.79	.67
PA-NE			0.78	.71
PA-NE			0.60	.67
PA-NE			0.57	.43
PA-NE			0.56	.69
PA-NE			0.34	.61
Eigenvalue	4.3	4.0	2.7	
Accounted variance of the factors	18%	16.8%	11.4%	

Note. Factor labels: 1 = positive interpretation; 2 = panic interpretation; 3 = neutral interpretation. Com. = communality.

TABLE 4. ROTATED FACTOR LOADINGS OF COLD-RELATED SITUATIONS (ONLY FACTOR LOADINGS GREATER THAN 0.30), COMMUNALITIES, EIGENVALUES, AND VARIANCE ACCOUNTED FOR BY FACTORS

	Factor Labels			
	1	2	3	Com.
CO-PA	0.87			.83
CO-PA	0.84			.78
CO-PA	0.80			.69
CO-PA	0.78			.67
CO-PA	0.77			.66
CO-PA	0.62			.61
CO-PA	0.61			.58
CO-PA	0.51			.45
CO-PO		0.81		.69
CO-PO		0.81		.73
CO-PO		0.77		.76
CO-PO		0.73		.67
CO-PO		0.69		.67
CO-PO		0.68		.66
CO-PO		0.66		.69
CO-PO		0.46		.74
CO-NE			0.72	.60
CO-NE			0.72	.59
CO-NE			0.65	.72
CO-NE			0.62	.49
CO-NE			0.34	.69
CO-NE			0.33	.69
Eigenvalue	4.7	4.5	2.5	
Accounted variance of the factors	19.7%	18.6%	10.3%	

Note. Factor labels: 1 = panic interpretation; 2 = cold interpretation; 3 = neutral interpretation. Com. = communality.

the PA-PA scale and total STAIC-T score was .43 ($p < .01$). Partial correlations were calculated to explore further the specific relationships between the PA-PA scale, the CASI and the STAIC-T. Results indicated that, when controlling for the influence of the CASI on PA-PA interpretation scores, the observed association between the PA-PA scale and the STAIC-T was no longer significant ($r = .05$). However, when controlling for the influence of the STAIC-T, the CASI retained a significant correlation with the PA-PA scale ($r = .37, p < .001$). The same pattern of results was also observed in examining relationships between the CO-PA scale of the AIQ-C, the CASI, and STAIC-T scores. Table 5 also reveals that there are relatively small correlations between the PA-PO scale and both the CASI and STAIC-T scores. As found in other studies (e.g. Muris, Schmidt, Merckelbach, & Schouten, 2001), responses to the CASI and STAIC-T were highly and significantly correlated ($r = .73, p < .01$).

Correlations With Coping Responses to Ambiguous Scenarios. Correlations between agreement with the different coping strategies provided and the scales of the AIQ-C were also calculated. The results are summarized in Table 6. Significant correlations were found between the avoidance strategy "I am going to run away to a safe place" and panic-related interpretations, with correlations of .52 with PA-PA and .34 for CO-PA. The coping strategy of "I will try to calm myself

TABLE 5. PEARSON'S CORRELATIONS AND PARTIAL CORRELATIONS BETWEEN AIQ-C SCALES, CASI, AND STAIC-T

Scale	Pearson's Correlation		Partial Correlation Controlling for STAIC-T	Partial Correlation Controlling for CASI
	CASI	STAIC-T	CASI	STAIC-T
PA-PA	.54*	.37*	.43*	.05
PA-NE	.31*	.09	.34*	.18
PA-PO	.11	.05	.19*	.16
CO-PA	.50*	.33*	.39*	.05
CO-NE	.37*	.13	.40*	.19
CO-CO	.15	.13	.09	.03

$^*p < .01$.

TABLE 6. PEARSON'S CORRELATIONS BETWEEN DEALING WITH THE SITUATION AND INTERPRETATION SCALES

	"I am not going to do anything."	"I will try to calm myself down."	"I will distract myself somehow."	"I am going to run away to a safe place."
PA-PA	.18*	.48**	.19*	.52**
PA-NE	.01	.39**	.29**	.08
PA-PO	.17*	.28**	.29**	.08
CO-PA	.10	.41**	.16	.34**
CO-NE	.04	.43**	.27**	.14
CO-CO	.08	.33**	.10	.07

$^*p < .01$. $^{**}p < .05$.

down" was significantly and positively correlated with all scales of the AIQ-C, indicating that it was a popular coping response choice, regardless of the threat perceived in a given scenario. The distraction-related coping strategy of "I will distract myself somehow" was most significantly associated with positive and neutral interpretations, although a small, marginally significant correlation was also observed between agreement with this strategy and panic-related interpretations on the PA-PA scale. The coping strategy represented by the statement "I am not going to do anything" demonstrated primarily small and nonsignificant correlations with the interpretation items.

DISCUSSION

In this study, the psychometric properties of a panic cue interpretation and corresponding coping strategy-focused questionnaire for children and adolescents were examined. Overall, the results of the present study indicate that the AIQ-C is a generally reliable and valid measure for the assessment of interpretations made about panic-relevant bodily sensations among children and adolescents between the ages of 9 and 14.

Content validity of the AIQ-C was examined in this investigation by asking a group of expert raters to assign potential interpretations of ambiguous scenarios to one of four categories (panic, neutral, positive, cold) defined by the authors. Interrater agreement among experts in our study resulted in kappa values between .87 and .95 and a mean percentage of agreement of 89%–96% per category. This indicates that experts assigned at least 89% of the items to the same category. Taking into consideration that kappa values above .80 reflect good to very good interrater agreement (Bortz & Döring, 1995), these results, indicating high agreement among experts, reflect the

AIQ-C's excellent content validity. Notably, the investigation of content validity via expert ratings is an important initial step in examining the properties of a new questionnaire measure. However, most studies investigating interpretation bias in children have not reported similar analyses.

In a second step, reliability and validity of the AIQ-C was investigated in a sample of school-age children (9–14 years). Analyses of the internal consistency regarding each AIQ-C scale indicated moderate to strong levels of internal consistency, with Cronbach's alphas for the various scales ranging from .74 to .89. This value is comparable to other questionnaires measuring childhood anxiety symptoms (e.g. CASI, Silverman et al., 1991). Item analyses indicated that elimination of items would not lead to higher internal consistency levels. Moreover, since corrected item-total correlations reflected adequate values of .5 or higher, it may be presumed that responses to unique scale items tend to be generally representative of the total test score on this measure. The high corrected item-total correlations and the good internal consistency values indicate that the AIQ-C is a reliable measure of interpretation bias in children and adolescents.

Examination of the factor structure of the AIQ-C related to the panic- and cold-relevant items, respectively, was in line with the theoretical underpinnings of the questionnaire. That is, an exploratory factor analysis of the panic-relevant situations produced the expected three factors, individually reflecting positive, panic, and neutral interpretations of panic-related scenarios, accounting for 46.2% of the AIQ-C variance. A 3-factor solution was also found for cold-relevant situations, representing panic, cold, and neutral interpretations of these situations and accounting for 48.7% of the questionnaire's variance. In essence, these findings suggest that there is a good agreement between the observed empirical data and the theoretical basis of the questionnaire.

The present study found significant correlations between panic-relevant interpretations of panic-oriented scenarios (PA-PA scale) and scores on the CASI, even with the influence of the STAIC-T removed. However, when controlling for levels of anxiety sensitivity, the correlation between STAIC-T and PA-PA scale was clearly attenuated and no longer attained statistical significance. The same pattern of results was found for panic interpretations of cold-relevant situations. These results are comparable to those in adult studies, which have found high correlations between questionnaires measuring panic-relevant interpretation bias and the Anxiety Sensitivity Index (Clark et al., 1997; Kamieniecki et al., 1997; Reiss, Peterson, Gursky, & McNally, 1986; Richards et al., 2001), suggesting that the AIQ-C and CASI are measuring similar constructs. In contrast, the STAIC-T and PA-PA scale of the AIQ-C are likely measuring fairly different constructs, as indicated by the fact that the correlation between panic-relevant interpretations and STAIC-T scores disappeared when the influence of the CASI was controlled. These results may suggest that interpretation bias related to panic situations, like anxiety sensitivity, is more clearly associated with the etiology and maintenance of PD and agoraphobia, whereas trait anxiety may be more strongly connected to other anxiety disorders.

In examining the discriminate validity of the AIQ-C, it appeared that positive interpretations of panic-relevant situations were not correlated with CASI scores and exhibited only a small correlation with the STAIC-T. Despite the lack of correlation with other measures, by assessing positive cognition as an interpretative choice, we have ensured that a balance between negative and positive cognitions is represented in the measure. The prominence of positive interpretations in the factor solution for panic-relevant scenarios may also support this decision. Moreover, previous studies typically assessed only negative and neutral cognitions in similar measures (Clark et al., 1997; Kamienecki et al., 1997; Richards et al., 2001). By monitoring positive interpretations of panic-relevant situations as well as negative and neutral ones, a more comprehensive observation of changes in interpretation style before and after treatment may be yielded from the AIQ-C (Cox, 1996).

Consistent with the findings of Barrett and associates (1996), our results demonstrated that avoidant solutions were highly correlated with panic interpretations of panic-relevant situations and evidenced a substantially smaller association with cold-relevant situations. In fact, no other coping strategy, including "distraction," "doing nothing," or "calm myself down" correlated specif-

ically with panic interpretations. However, the coping strategy represented by the notion of calming oneself down correlated significantly with all scales of the AIQ-C. This finding may indicate that this strategy could be used irrespective of the appraised threat in a given situation or it may reflect the possibility that children viewed this choice as the most socially acceptable coping strategy offered. In contrast, the strategy of "I am not going to do anything" evidenced relatively small correlations with the different AIQ-C scales. It is possible that children did not understand what this coping strategy would entail or were not cognitively developed enough to recognize a lack of responding as a valid coping choice. The coping strategy of distracting oneself correlated significantly with neutral interpretations and positive interpretations of both panic- and cold-relevant scenarios, indicating that distraction may be a typical response to the interpretation that an ambiguous situation is relatively benign. Austin and Richards (2001) noted that the assessment of catastrophic interpretations should not only include questions about the first interpretation of a given scenario, but also contain an indication of what kind of response is likely to follow the first interpretation, and how unpleasant these outcomes might be for an individual. We adapted this procedure for the AIQ-C by assessing the acceptability of children's strategies for coping with the situations, a choice that likely reflects a more developmentally appropriate method for identifying such responses to threatening and nonthreatening interpretations of ambiguous scenarios.

In conclusion, this investigation demonstrated that the AIQ-C has good construct, convergent, and discriminate validity as well as good internal consistency. However, there are some limitations that should be noted. Test-retest reliability was not assessed in this investigation. Furthermore, the utility of this questionnaire with a clinical sample was not established. Both of these limitations are being remedied in current investigations of the AIQ-C with both a clinical sample and a sample of children at high risk for the development of PD. In addition to the current study, by utilizing the AIQ-C with these additional samples, greater insight may be yielded regarding the role of threat-related interpretations in the etiology of anxiety disorders, a process that may also lead to additional methodologies for assessing the risk of PD development in children.

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