

Original Communication

The Picture Anxiety Test (PAT)

Psychometric Properties in a Community Sample of Young Children

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Abstract. This study extends prior research on the Picture Anxiety Test (PAT; Dubi & Schneider, 2009) in clinical samples, by examining psychometric properties and acceptance in a community sample of 153 4–8-year-old children. Children completed the PAT and the RCMAS, a well-established questionnaire measuring anxiety. Parents and teachers completed questionnaires on anxiety and externalizing behavior. In addition, a panel of psychologists and psychiatrists evaluated the PAT for quality and utility. Results indicated high internal consistencies for the subscales and composite scale, very high interrater reliability, and moderate to high test-retest reliability. Substantial correlations between the PAT and the RCMAS indicated good convergent validity. Sex and age differences were found for some subscales. Agreement between children and their parents and teachers was generally low. Children reported high acceptance of the PAT, and the panel of psychologists and psychiatrists rated the PAT as high in both quality and utility. Results were consistent with prior research on the PAT in clinical samples and indicate reliability and validity for assessing anxiety in a subclinical community sample.

Keywords: anxiety, children, measurement, psychometrics

Although anxiety disorders can emerge at a very young age, and early identification is of widely recognized importance (Hirshfeld-Becker & Biederman, 2002; Schniering & Lyneham, 2007), the largest body of research on childhood anxiety exists for children 8 years and above (Cartwright-Hatton, McNicol, & Doubleday, 2006; Kessler et al., 2005), and few valid and reliable measurements assess symptoms in very young children. Indeed, the majority of clinician-administered diagnostic interviews or parent/teacher questionnaires for the assessment of preschool anxiety symptoms are adaptations of measures developed, standardized, and validated on older children or adults (Spence, Rapee, McDonald, & Ingram, 2001). Further, existing self-report measures modified for young children from text-based measures designed for older children (e.g., Revised Children's Manifest Anxiety Scale; Reynolds & Richmond, 1978; State-Trait Anxiety Inventory for Children; Spielberger, 1973) may not be easily understood by some young children and may contain content irrelevant to preschool-age children (Spence et al., 2001). The Picture Anxiety Test (PAT; Dubi & Schneider, 2009) addresses the need for a preschool-appropriate measure of anxiety by using pictures in lieu of text and by including age-appropriate content.

The PAT was specifically developed to be age-appropriate for young children, in line with recommendations that assessment tools for children correspond to their cognitive

and verbal skills (King, Muris, & Ollendick, 2004; Ollendick, Davis, & Muris, 2004). In the past, young children's still-developing cognition and language skills (Piaget, 1970; Yates, 1990) may have deterred some researchers from designing assessment tools for them (Valla, Bergeron, Bérubé, Gaudet, & St-Georges, 1994). However, the use of pictures in measures for young children is gaining ground (Ernst, Cookus, & Moravec, 2000; Ernst, Godfrey, Silva, Pouget, & Welkowitz, 1994; Muris et al., 2003; Valla et al., 1994; Valla, Bergeron, & Smolla, 2000), making the measures accessible to nonreaders and serving to focus attention, stimulate interest, and increase participation (Ernst et al., 1994; Valla et al., 1994, 2000). Three prior measures used pictures to assess anxiety in children: the Dominic-R (Valla et al., 1994), the Pictorial Instrument for Children and Adolescents (PICA-III-R; Ernst et al., 1994), and the Koala Fear Questionnaire (KFQ; Muris et al., 2003). However, neither the Dominic-R nor the PICA-III can be used with children younger than 6 years of age, and the KFQ has not been validated for use in clinical and therapeutic settings. Further, the pictures in the KFQ are monochromatic, perhaps not as child-friendly as color pictures would be. Finally, the KFQ, the only prior measure for children as young as 4 years, is not available in the language of the target population of the present study (German). The PAT (Dubi & Schneider, 2009) fills a measurement gap in that

it is designed for preschool-age children from 4 to 8 years of age, using full-color pictures and materials in German. Translations into English are also underway and available from the authors.

As outlined in Dubi and Schneider (2009), the Picture Anxiety Test (PAT) is a multidimensional assessment of a range of anxieties and avoidance patterns based on criteria outlined in the DSM-IV-TR (American Psychiatric Association, 2000) for specific phobia, social phobia, generalized anxiety disorder, and separation anxiety disorder, and serves as part of a multiinformant clinical assessment (Cartwright-Hatton et al., 2006; Ollendick et al., 2004; Spielberger, 1973). In clinical cases, it is intended to be used in conjunction with structured parent interviews in order to obtain complete information about diagnostic criteria such as duration and onset of anxiety symptoms, which are difficult for young children to report on.

Initial validation in a sample of 71 children between the ages of 5 and 7.9 years with separation anxiety disorders, other mixed anxiety disorders, and no mental disorder indicated good psychometric properties (Dubi & Schneider, 2009). Reliability estimates (Cronbach's α) indicated reliabilities between $\alpha = .76$ and $.87$ across the whole sample, with reliability slightly lower at $\alpha = .63$ for the anxiety scale in the healthy control group. However, this sample was notably limited by the small number of children (19) in the healthy control group. Test-retest reliability was moderate but not significant for the avoidance scale ($r = .30$) and strong for the anxiety scale and the composite ($r = .63$ and $.49$, respectively). PAT scores were generally moderately to strongly correlated with other child self-report measures of anxiety, parent-rated separation anxiety and general anxiety (PAT anxiety and composite, but not avoidance scales), and a clinician-rated global assessment of functioning. PAT scores were not significantly correlated with ratings of externalizing problems, indicating discriminant validity. Further, analyses indicated that the PAT discriminated between children with and without anxiety disorders with large effect sizes and was sensitive to treatment effects.

With the aim of examining the generalizability of the psychometric properties of the PAT, the present study seeks to extend the work of Dubi and Schneider (2009) in a larger sample of nonclinical community children and families. Further, the present study presents findings on the face validity of the PAT via formal analysis of psychologists' and psychiatrists' views of the utility and the quality of the items, as preliminarily alluded to in Dubi and Schneider, as well as children's acceptance of the instrument. Finally, the present study examines age and sex effects on PAT responses. Hypotheses included the following:

- 1) Psychologists and psychiatrists were asked to accurately classify the items into the four respective anxiety categories.
- 2) Due to the PAT's pictorial format, children aged 4 to 8 years were expected to accept it well.

- 3) The PAT was expected to yield acceptable internal consistency, interrater reliability, and test-retest reliability.
- 4) Age and sex effects in the prevalence of anxiety symptoms were expected, such that younger children would show a higher prevalence of separation anxiety and girls would show a higher prevalence of anxiety symptoms in general.
- 5) Correlations of the PAT with other self-, parent-, and teacher-report anxiety measurements were expected.

Method

Procedure

Teachers and caregivers from 18 primary school classes, 16 kindergartens, and 4 day-care centers in the metropolitan area of Basel, Switzerland, were contacted and invited to participate in the study. The 29 teachers who agreed to participate gave their pupils information about the study and an informed consent letter to take home to their parents. The teachers then sent the completed and signed consent forms back to the researchers. The parents of 153 children agreed to participate, representing a 27% response rate. The children were interviewed individually in a room at their school, kindergarten, or day-care center in a session lasting 30 to 45 minutes and conducted by one of four trained interviewers. Forty-two sessions were recorded with a camera and recoded afterward by another researcher to check for interrater reliability. Forty children (21 girls, 19 boys, $M_{age} = 7.0$ years, $SD = 1.0$) took part in a second administration of the PAT by a different researcher who was blind to the first assessment, 4 to 6 weeks following the first test. Parent and teacher questionnaires were completed at home and sent back to the researchers by mail.

Participants

Community Children and Their Families

Participants in this community sample were recruited in Basel, Switzerland, and included 153 children aged 4 years to 8 years ($M_{age} = 6.83$ years, $SD = 1.16$; 83 boys, 70 girls), their primary caregivers ($N = 148$; 102 mothers, 9 fathers, 37 mothers and fathers together), and their teachers or caregivers in day-care centers ($N = 153$). 68 (44%) children were in preschool or kindergarten (typically age 5–6), 85 (56%) were in primary school (typically age 7 and older, and in grade 1 and above). The majority of families spoke German (85.5%) at home. Other languages spoken at home included Spanish (4.6%), Bosnian (2.6%), French, Italian, and Turkish (each 2%), Albanian, Serbian, and Dutch (each 0.7%). All measures were presented in German. Data on socioeconomic status were not available. All participants provided written or (in the case of preliterate children) ver-

bal consent. The study was approved by the local ethics committee for medical research.

Professionals in the Field

A panel of psychologists and psychiatrists working with children in the diagnostic and therapeutic field were also recruited to evaluate the quality and utility of the PAT. The panel consisted of 30 clinicians (25 females, 5 males; $M_{age} = 35.5$, $SD = 8.0$) experienced in assessing, diagnosing, and treating anxious children, and either working as child psychologists or psychiatrists in hospitals, health services, or universities. To be included in the study, the psychologists and psychiatrists needed to have at least 1 year of work experience and/or 1 year of psychotherapeutic training. The psychologists and psychiatrists provided written consent to participate.

Measures

Picture Anxiety Test (PAT)

The PAT (Dubi & Schneider, 2009) assesses anxiety and avoidance using 21 hypothetical vignettes presenting scenarios involving situations and objects that young children are most likely to fear (Muris & Merckelbach, 2000; Muris, Merckelbach, Mayer, & Prins, 2000), with an administration time of 20 to 30 minutes. The 21 items represent primary symptoms of specific phobia (SpP; 14 items), social phobia (SP; 3 items), generalized anxiety disorder (GAD; 2 items), and separation anxiety (SAD; 2 items). For each item, two color pictures depicting children (sex-matched to the child) engaging in responses to the feared situation are presented simultaneously, one depicting fear and avoidance and the other depicting a neutral response. To avoid systematic carryover effects, items were counterbalanced across children. Half of the children started with Picture 1, the other half with Picture 11. The participating child is asked to indicate which child he or she resembles and to then indicate the strength of his or her choice in a response format resembling the Harter scales (Harter, 1982; Harter & Pike, 1984) on a scale ranging from 0 (*not at all*) to 3 (*very much*). Further, children provide separate ratings for anxiety and avoidance, and the clinician is allowed to adjust ratings if necessary based on his/her clinical judgment of the child's reaction. In order to assess impairment and distress in daily life, children who indicate high to very high anxiety or avoidance (scores ≥ 2) are asked if they wish the anxiety or avoidance would be less and whether or not they needed help to lessen the anxiety or avoidance.

Rather than using DSM-IV-TR diagnosis classification, the PAT provides a measure of dimensional anxiety and avoidance across the four anxiety categories described above (SpP, SP, GAD, SAD). The PAT yields three primary scores: total anxiety, total avoidance, and a composite score

(anxiety + avoidance). As with structured interviews, the interviewer can examine the mean score within each anxiety category to determine whether one of the four categories should be explored further as a possible diagnosis. Because of the low number of items in the categories SAD, GAD, and SP, and because not all DSM criteria are assessed in the PAT, no separate tests with respect to reliability and validity are reported for these category scores.

PAT Acceptability

Two questions at the end of the administration of the PAT assessed acceptability. Children were asked how they think the pictures looked using the following ratings: 0 = *ugly*, 1 = *fair*, 2 = *attractive*. They were also asked whether or not they would like to look at these pictures another time, with responses in a yes/no format.

Professional Ratings of the PAT

Psychologists and psychiatrists were asked to assign each of the 21 sets of pictures in the PAT to one of four anxiety disorders and to rate how well each picture represents the disorder on a scale ranging from 1 (*not at all*) to 4 (*very well*). They also completed a 7-item questionnaire about the quality, utility, suitability, and necessity of the PAT, rating each item on a scale ranging from 1 (*not at all*) to 4 (*very much*). The questions are presented in the results section in Table 2. Participating psychologists and psychiatrists received the questionnaire and evaluation materials by mail, completed them on their own, and sent the materials back to the university by mail.

Revised Children's Manifest Anxiety Scale

Children completed the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978), a text-based measure of chronic anxiety consisting of 37 items (28 anxiety items and 9 items to check for socially desirable responding) answered in a yes/no response format. The RCMAS is a widely-used measure designed for children aged 6 years and above. However, as our sample contained preliterate children, the questions were read aloud to the children. Ialongo, Edelsohn, Werhamer-Larsson, Crockett, and Kellam (1994) used a similar format in their study with children aged 5 years and above and reported good internal consistency. The internal consistency of the RCMAS in the current total sample of children was $\alpha = .87$ (preschool children: $\alpha = .91$, primary school children: $\alpha = .80$).

Parents completed the parent version of the RCMAS (RCMAS-P; Pina, Silverman, Saavedra, & Weems, 2001), containing items that parallel the child version. The internal consistency of the parent version of the RCMAS in the

current sample was $\alpha = .80$ (parents of preschool children: $\alpha = .77$, parents of primary school children: $\alpha = .81$).

Strengths and Difficulties Questionnaire

Parents also completed the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997), which contains a total of 25 items on 5 subscales consisting of 5 items each. Each symptom is rated on a scale ranging from 0 (*not true*) to 2 (*certainly true*), with scores averaged across items within each subscale. The five areas assessed include emotional symptoms, conduct problems, hyperactivity, peer problems, and prosocial behavior. Prior research indicates good psychometric properties (Goodman, 1997). Internal consistencies in the current sample were between $\alpha = .51$ and $.68$ for each of the five SDQ subscales (parents of preschool children: α between $.54$ and $.64$, parents of primary school children: α between $.42$ and $.72$).

Teachers also completed the SDQ in order to provide further information about the presence of internalizing and/or externalizing difficulties at school. Internal consistencies for each of the five SDQ subscales were between $\alpha = .70$ and $.88$ (teachers of preschool children: α between $.62$ and $.89$, teachers of primary school children: α between $.75$ and $.86$).

Data Analyses

Psychometric analyses were conducted using responses from the first administration of the PAT. Internal consistency of the PAT was computed using the Cronbach's coefficient α and interrater reliability by calculating Cohen's Kappa. Test-retest reliability across the first and second PAT assessments was evaluated by calculating Pearson product-moment correlations. Age effects were evaluated using Pearson product-moment correlations, and sex effects were calculated with independent *t*-tests. Finally, Pearson product-moment correlations provided an indication of the strength of the relationships between PAT scores and other measures of anxiety and externalizing behavior. Cohen's (1988) classification of correlations was used to evaluate the magnitude of associations (large correlations: $r \geq .50$, medium correlations: r between $.30$ and $.49$, small correlations: r between $.10$ and $.29$). Likewise, following Cohen (1988), effect sizes of $d \geq 0.8$ were classified as large effects.

Results

Evaluation of the PAT by Psychologists and Psychiatrists

Table 1 presents the psychologists' and psychiatrists' placement of the pictures into one of the four anxiety cat-

egories as well as their ratings of how well each picture represents the respective anxiety disorder. Item classification by the panel of psychologists and psychiatrists was generally consistent (at least 80% agreement for all items and over 95% agreement for 14 items) with the authors' original classification. Psychologists' and psychiatrists' ratings of how well each picture represents the disorder (from 1 = *not at all* to 4 = *very well*) were analyzed conservatively, with ratings recoded as 1 when a given psychologist/psychiatrist categorized the picture incongruently with the intended disorder (i.e., when he/she categorized a specific phobia picture as representing another disorder, his/her rating of how well the picture matched the disorder would be recoded as 1). Recoded results yielded mean ratings of over 3 on all pictures except one, indicating that, in general, psychologists/psychiatrists thought the pictures represented the intended disorders. Finally, their ratings of the face validity, utility, suitability, and necessity of the PAT were high to very high and are presented in Table 2.

Psychometric Properties

Acceptability

Analyses revealed a very high acceptability of the pictures ($M = 1.86$, $SD = 0.37$; possible range: 0–2). 132 children (86.3%) reported that they thought the pictures were attractive, whereas 20 children (13.1%) liked them moderately, and only 1 child (0.7%) thought the pictures were ugly. 130 children (85%) said they would like to look at the pictures again.

Internal Consistency

Internal consistencies were calculated for the anxiety and avoidance subscales, as well as for the composite PAT score. Cronbach's α was $.78$ for the anxiety subscale (preschool children: $\alpha = .74$, primary school children: $\alpha = .83$), $.77$ for the avoidance subscale (preschool children: $\alpha = .73$, primary school children: $\alpha = .81$), and $.88$ for the composite score (preschool children: $\alpha = .86$, primary school children: $\alpha = .90$), indicating good internal consistency across scales and age groups.

Interrater Reliability

Interrater reliabilities were calculated for each item on the anxiety and avoidance ratings. Cohen's Kappa for the anxiety ratings ranged from $\kappa = .83$ to 1.0 (mean $\kappa = .96$) and from $\kappa = .79$ to 1.0 (mean $\kappa = .90$) for the avoidance ratings. These reliability estimates indicate an excellent level of coding agreement.

Table 1

Psychologists'/psychiatrists' ratings: Allocation of pictures to anxiety disorders and rating of suitability of pictures for specific disorder

Item	% Correct allocation (<i>n</i>)	Incorrect or ambiguous allocation (<i>n</i>)	Suitability of picture for disorder <i>M</i> (<i>SD</i>)
SpP: Birds	100% (30)		3.53 (.68)
SpP: Dogs	100% (30)		3.70 (.47)
SpP: Spiders	100% (30)		3.87 (.35)
SpP: Doctors	87% (26)	GAD (2), SP (2)	3.40 (1.04)
SpP: Blood	100% (30)		3.67 (.55)
SpP: Thunderstorms	100% (30)		3.87 (.35)
SpP: Fireworks	93% (28)	GAD (1), SP (1)	3.43 (.86)
SpP: Loud noises	90% (27)	GAD (2), SP (1)	3.13 (.97)
SpP: Disguised people	83% (25)	GAD (1), SP (4)	3.00 (1.11)
SpP: Heights	97% (29)	GAD (1)	3.50 (.78)
SpP: Elevators	97% (29)	GAD (1)	3.73 (.64)
SpP: Insects	100% (30)		3.63 (.49)
SpP: Darkness	100% (30)	GAD (2)	3.60 (.62)
SpP: Monsters/ghosts	87% (26)	GAD (3), no allocation (1)	3.34 (1.01)
SP: Talk/play with familiar children	100% (30)		3.63 (.62)
SP: Talk/play with unfamiliar children	100% (30)		3.17 (.87)
SP: Talk in front of a group	100% (30)		3.90 (.31)
GAD: Worry	100% (30)		3.83 (.38)
GAD: Do everything correctly	80% (24)	SAD (6)	2.57 (.97)
SAD: Go to school	100% (30)		3.97 (.18)
SAD: Sleep alone	90% (27)	GAD (2), SpP (1)	3.60 (.62)

Notes. SpP = specific phobia, SP = social phobia, GAD = generalized anxiety disorder, SAD = separation anxiety disorder, range of suitability of picture for disorder: 1 (*very low suitability*) – 4 (*very high suitability*).

Table 2

Psychologists'/psychiatrists' rating of the quality of the PAT

Question	Rating <i>M</i> (<i>SD</i>)
Necessity of a new anxiety test for children between 4 and 8 years	3.90 (.31)
All essential anxiety disorders are included	3.52 (.58)
Pictures suitable/attractive for children	3.70 (.47)
Questions comprehensible for children	3.67 (.48)
Rating scale (0 to 3) comprehensible for children	3.70 (.54)
Size of test adequate for children	3.70 (.47)
Personal interest of employing the PAT in clinical practice	3.41 (.63)

Notes. Range of ratings: 1 (*not at all*) – 4 (*very much*).

Test-Retest Reliability

Correlations between PAT scores at Time 1 and Time 2 (*n* = 40) were calculated to estimate the stability of the measure over 4 to 6 weeks. Strong correlations were found for all three PAT scales: anxiety score, *r* = .65; avoidance score, *r* = .67; composite score, *r* = .71, indicating adequate test-retest reliability.

Age and Sex Effects

Table 3 displays descriptive statistics for the self-report measures for the total sample and for boys and girls separately. In general, children's anxiety and avoidance levels were low, with a mean total anxiety and avoidance level of 0.38 (*SD* = .30; possible range = 0–3). On average, only 9.5% of all children indicated fear levels ≥ 2 and only 8.4% indicated avoidance levels ≥ 2. A Bonferroni-adjusted *p*-value was calculated by dividing *p* = .05 by a total of 12 scales, and thus set at .004. Independent *t*-tests revealed sex effects for the specific phobia subscales. Compared to boys, girls tended to report both higher anxiety (*t*(151) = 4.08, *p* < .004, *d* = 0.68) and avoidance (*t*(151) = 3.45, *p* < .004, *d* = 0.51) in specific phobia situations, with medium effect sizes. To check for age differences, correlations between age and the three primary PAT scores (anxiety, avoidance, and composite), the disorder-specific subscales, and the child-rated RCMAS scores were calculated. A Bonferroni-adjusted *p*-value was calculated by dividing *p* = .05 by a total of 12 scales, and thus set at .004. Small negative correlations were found for the separation anxiety situations (*r* = -.24, significant at *p* < .004 for the anxiety subscale; *r* = -.21, trend at *p* = .008 for the avoidance subscale) and for the RCMAS (*r* = -.18, trend at *p* = .03).

Table 3
Mean scores and sex differences on PAT scales and child-rated RCMAS

Scale	Total (n = 153)	Boys (n = 83)	Girls (n = 70)	t(df = 151)	d
PAT composite score	.38 (.30)	.35 (.30)	.42 (.29)	1.35	
PAT total anxiety	.38 (.32)	.35 (.31)	.42 (.32)	1.52	
SpP anxiety	.46 (.32)	.36 (.30)	.57 (.32)	4.08**	.68
SP anxiety	.41 (.41)	.38 (.47)	.44 (.48)	.74	
GAD anxiety	.39 (.43)	.34 (.40)	.44 (.46)	1.34	
SAD anxiety	.28 (.46)	.30 (.49)	.25 (.42)	-.60	
PAT total avoidance	.39 (.31)	.36 (.32)	.42 (.29)	1.07	
SpP avoidance	.38 (.30)	.31 (.26)	.46 (.32)	3.45**	.51
SP avoidance	.40 (.48)	.39 (.47)	.41 (.49)	.32	
GAD avoidance	.44 (.53)	.42 (.53)	.46 (.53)	.50	
SAD avoidance	.33 (.44)	.34 (.46)	.32 (.41)	-.22	
RCMAS total score	6.61 (5.44)	6.42 (5.66)	6.84 (5.20)	.47	

Notes. PAT = Picture Anxiety Test, SpP = specific phobia items, SP = social phobia items, GAD = generalized anxiety items, SAD = separation anxiety items, RCMAS = Child-rated Revised Children's Manifest Anxiety Scale. Range of PAT: 0 (*no anxiety/avoidance*) – 3 (*very high anxiety/avoidance*); range of RCMAS: 0–28. ** $p < .004$ (Bonferroni-adjusted).

Convergent and Discriminant Validity

Convergent validity of the PAT was examined by correlating scores from the PAT scales with anxiety scores from the RCMAS (child and parent report) and the emotional symptoms subscale of the SDQ (parent and teacher report). To assess discriminant validity of the PAT, scores from the three subscales of the PAT were correlated with the externalizing behavior subscale from the SDQ. The correlations were expected to be higher for internalizing symptoms (RCMAS, SDQ emotional symptoms subscale) than for externalizing symptoms (SDQ externalizing behavior subscale). A Bonferroni-adjusted p -value was calculated by dividing $p = .05$ by a total of 21 correlations (3 PAT scales each correlated with 5 scales measuring convergent validity and 2 scales measuring divergent validity) and thus set at .002. Results showed strong correlations at the Bonferroni-adjusted significance level between child-report RCMAS and PAT scales (full sample composite score $r = .51$, total anxiety score $r = .50$, total avoidance score $r = .47$, all $ps < .001$; preschool children: composite score $r = .42$, total anxiety score $r = .41$, total avoidance score $r = .40$, all $ps < .001$; primary school children: composite score $r = .64$, total anxiety score $r = .65$, total avoidance score $r = .58$, all $ps < .001$). Further, the relationship between the PAT scores (composite score, total anxiety score, total avoidance score) and parents' ratings on the RCMAS was not significant (all rs between .12 and .06, $p > .05$; preschool children: all rs between -.04 and .04, $p > .05$; primary school children: all rs between .14 and .19, $p > .05$). Similarly, no significant correlations were found between the three PAT scores and the internalizing scores for parents' ratings on the SDQ (all rs between .08 and .11, $p >$

.05; preschool children: all rs between .05 and .06, $p > .05$; primary school children: all rs between .11 and .17, $p > .05$ or between the three PAT scores and the externalizing scores of the SDQ. Finally, teachers' ratings of internalizing symptoms (SDQ) did not correlate significantly with children's scores on the PAT (all rs between -.04 and -.02, $p > .05$; preschool children: all rs between -.11 and -.12, $p > .05$; primary school children: all rs between .03 and .08, $p > .05$). Thus, the convergent validity of the PAT scores was supported based on an alternative child-report measure of anxiety, but not with respect to information provided by parents or teachers.

Discussion

The present study extended previous research on the psychometric reliability and validity of the Picture Anxiety Test (PAT), a relatively brief full-color pictorial assessment of anxiety, fears, and avoidance in young children (Dubi & Schneider, 2009), to a community sample, and expanded on knowledge of the properties of the PAT in an examination of psychologists' and psychiatrists' ratings of the instrument, children's acceptance, and sex and age effects.

The results indicated that items were generally classifiable by a panel of psychologists and psychiatrists in a manner consistent with the authors' classification. While some items attained less than 100% consistent classification by the psychologists and psychiatrists, all were above 80%. Further, the face validity of the PAT was rated by psychologists/psychiatrists to be high, and children's interest in and acceptance of the items on the PAT were also very high.

Consistent with Dubi and Schneider (2009), the internal consistencies of the composite scale and the anxiety and avoidance scales were high, with Cronbach's α between .77 and .88; the results for the preschool and primary school groups were similar. These reliabilities are actually higher than those obtained with Dubi and Schneider's clinical sample, which is likely due to the greater sample size in the present study. In addition, interrater reliability was very good (κ between .79 and 1.0), and test-retest reliability over 4 to 6 weeks was high with r between .65 and .71. In sum, reliability analyses indicated high internal consistency, interrater reliability, and test-retest reliability in this community sample, indicating good generalizability of Dubi and Schneider's findings, and reliability and test-retest stability equivalent or higher than those of similar picture-based measurements such as the Dominic-R (Valla et al., 1994), PICA-III-R (Ernst et al., 1994), and KFQ (Muris et al., 2003).

In the community sample assessed in the current study, 8–10% of all children indicated fear or avoidance levels greater than or equal to 2 (i.e., heightened to very high anxiety or avoidance). This prevalence rate is in line with epidemiologic data on the 6-month prevalence of anxiety disorders in children and adolescents conducted in Switzerland (Steinhausen, Winkler Metzke, Meier, & Kannenberg, 1998), which found a prevalence rate of 11.4% for all anxiety disorders. In their review of international epidemiological studies on prevalence rates of mental disorders in children, Ihle and Esser (2002) also reported a median prevalence (6-month to lifetime prevalence) of anxiety disorders approximating this range, at 10.4% across ages and 7% in children below the age of 13. Thus, the percentage of children with anxiety symptoms as indexed by the PAT in the current sample is comparable to percentages obtained in other community samples.

Convergent validity was evaluated in part by examinations of age and sex effects. Consistent with the literature on sex differences in anxiety (Broeren & Muris, 2008; Gullone, 2000; Spence, 1998), girls tended to report greater anxiety and avoidance in specific phobia situations than did boys, with medium effects. In terms of age differences, we found a significant negative correlation between age and the PAT separation anxiety fears scale as well as negative correlation trends between age and the PAT separation anxiety avoidance scale and the RCMAS. These trends and the direction of effects are in line with the age-related decreases in anxiety reported in other studies (Boehnke, Silbereisen, Reynolds, & Richmond, 1986; Ford, Goodman, & Meltzer, 2003; Gullone, 2000; Spence, 1998; Turgeon & Chartrand, 2003).

The convergent validity of the PAT was further supported by a high correlation between the total PAT score and the total score on a widely used measure of childhood anxiety, the RCMAS. Correlations were slightly higher for the primary school children than for the preschool children. However, it is possible that even stronger associations could be found when correlating the PAT with a child-re-

port instrument that assesses anxiety in specific situations (e.g., Spence Children's Anxiety Scale, SCAS; Spence, 1998) rather than trait anxiety as the RCMAS does. Further studies are needed to test this hypothesis.

The relationship between the PAT and parents' ratings of anxiety on the RCMAS was also examined to evaluate convergent validity. No significant associations were found between the PAT and parent-rated anxiety in either the preschool or the primary school children. One explanation for this may be the generally low agreement between children's subjective perceptions of their own anxiety and their parents' and teachers' perceptions, a phenomenon well-documented in previous research (Birmaher et al., 1997; Cartwright-Hatton et al., 2006; Grills & Ollendick, 2003; Muris et al., 2003; Spence, 1998). Even when all raters used the same instrument, the relationships between parents' and children's perceptions tend to be small in magnitude, at $r = .30$ on the SCARED instrument (Birmaher et al., 1997) and $\kappa = .24$ to $.37$ for agreement on the ADIS (Grills & Ollendick, 2003). The different response formats used in the present study likely attenuated the already low agreement even further. Another explanation for the non-significant associations between children's ratings and those of their parents and teachers could lie in the low variances in the anxiety and avoidance scores, as the presence of restricted variance decreases the likelihood of rejecting the null hypothesis in correlational analyses (Bortz, 2005). Nevertheless, despite the low agreement, gathering diagnostic information from multiple sources and employing different instruments is considered the best practice in child assessment in both clinical and epidemiological settings (Valla et al., 2000) and is highly recommended (Cartwright-Hatton et al., 2006; Silverman & Ollendick, 2005). Indeed, a lack of agreement between informants makes it even more crucial to ask even young children for their own perspective on their mental health. The PAT provides one piece of the puzzle in illuminating young children's perceptions of their anxieties and fears in a developmentally appropriate way.

Some limitations of the present study should be noted. First, as was the stated aim of the present study, the children in the sample were drawn from the community. However, they were therefore at low to medium risk for developing or having anxiety problems, with most children in the sample reporting few or no anxiety symptoms. The low prevalence of mental disorders in community child samples can be a limitation in this type of study, as variability in the data is limited, and is a problem that has confronted other researchers (Ialongo et al., 1994; Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000). The utility of the PAT in a clinical sample has been studied with promising results and is described elsewhere (Dubi & Schneider, 2009). Still, future studies should further examine the psychometric properties of the PAT in a larger sample of children with and without anxiety diagnoses. Second, the mean age of the children in the present sample was 6.83 years, with young children between 4 and 6 years

slightly underrepresented and children younger than 4 not included at all. However, it is generally known that conducting research with preschool children is often difficult as parents are reluctant to participate with their young children. Therefore, future research on the psychometric properties of the PAT should focus on samples with greater numbers of younger children. A third limitation of this study is the limited participation rate (27%). Teachers were asked to inform children about the study and to provide them with written information for their parents. However, information about why nearly three quarters of all families chose not to participate in the study was not available. A comparison against demographic data from the total population of the schools and day-care centers indicates that children from ethnic minorities, in particular, were underrepresented. Thus, it is possible that limited knowledge of the German language was one reason for the low participation rate. Consequently, the extent to which the current findings can be generalized to the broader population, especially ethnic minorities, remains unclear.

Future research on the validity of the PAT may benefit from a comparison of PAT scores to direct observations of child anxiety responses in real-time anxiety situations (such as separating from a parent). Future research should also examine the ecological validity of the PAT, determining its psychometric properties and clinical utility when used by clinicians in clinical settings, as well as the acceptability of the PAT by psychologists/psychiatrists using it in research or clinical settings. While the test administration time is relatively short for the PAT, and administration fairly straightforward, management of the materials, and the amount of practice needed to master administration should be field tested with clinicians. Further, future research should examine feasibility of standardizing the PAT or creating clinical cutoffs for the practical identification of child anxiety disorders in combination with parent interviews. Finally, in order to obtain a more detailed picture of the child's anxiety symptoms, the validity of the mean scores of each diagnostic category (SpP, SP, GAD, SAD) could be examined. Similar to commonly used structured interviews and the interpretation procedures for the SCAS (Spence, 1998), it may be possible to analyze the PAT separately for each anxiety disorder and to use the mean scores of the four categories for clinical and therapeutic purposes.

In conclusion, results from the present study as well as from Dubi and Schneider (2009) point to the reliability and validity of the Picture Anxiety Test for assessing anxiety and fears in young children in the community as well as in clinically-referred populations. Use of the PAT is recommended for supplemental use along with a structured diagnostic interview conducted with parents. While additional research is needed, the initial results suggest that the PAT may serve as an informative step in clinical interviewing and may be a valuable addition to typical assessments in both research as well as clinical practice.

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