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Anger Questionnaire for school-age children (6 years)

Development and description

Internal emotions have been considered to be difficult for parents and teachers to identify accurately (Quay & La Greca, 1986). Anger is an internal state of arousal, so self-report measures are needed as they provide information about the experience and its expression (Kerr & Schneider, 2008). Children are able to inform about themselves if proper questions are asked (Norwood, 2007). The most used instruments to measure anger were not available for age 6, so we developed the Anger Questionnaire (AQ) for school-age.
Questionnaire has two differentiated blocks, I and II, with a total of 40 items with 3 response options. Block I describes situations that make the children prone to anger (16 items) and block II measures the type of responses children do when they are angry or out of control (24 items). Block I contains sentences that present day-to day situations, problems or triggers that children may be mad at, also some questions express proneness to lose of control (e.g., "You get angry when you are told to go to bed". Block II is meant to catch what children do when they are angry (e.g., When you are angry you swear").
This report informs briefly about the psychometric properties of the questionnaire.

Method

Participants

Study included 511 children, 253 girls and 258 boys, with a mean age of 6.6 years (*SD* = 0.36), 97.3% born in Spain; 90.8% Caucasian, 5.5% Latino and 3.7% other ethnicity; 33.4% high socioeconomic status, 47.8% middle, and 18.8% low; 66.7% from state- and 33.3% from state-subsidized schools. Detailed sample characteristics and design are described in (Ezpeleta, de la Osa, & Doménech, 2014).

Material

The AQ scores were correlated to other measures of psychopathology, aggressive behaviour and functioning:

The *Strengths and Difficulties Questionnaire* (SDQ; (Goodman, 2001) assesses children's mental health with 25 items on five scales: emotional symptoms, conduct problems, hyperactivity, peer relationship problems, and prosocial behavior. The items on the first four scales provide a total difficulties score.

The *Child Behavior Checklist* (CBCL/6-18; (Achenbach & Rescorla, 2001) measure behavioral and emotional problems as reported by parents through 112 items with 3 response options (0: *not true*, 1: *somewhat/sometimes true*, 2: *very true/often true*). Empirical scales were used.

The *Diagnostic Interview for Children and Adolescents for Parents of Preschool and Young Children* (DICA-PPYC; (Ezpeleta, de la Osa, Granero, Doménech, & Reich, 2011) is a computerized, semi-structured diagnostic interview for assessing the most common psychological disorders in children as reported by parents, following the DSM-5 criteria (American Psychiatric Association, 2013). Diagnoses of ADHD, ODD, any anxiety disorder (separation, generalized, specific phobia and social anxiety) and any comorbidity (includes the previously listed disorders plus conduct problems and major depression) and the presence of comorbidity were related with the AQ.

The *Inventory of Callous-Unemotional Traits* (ICU; (Frick, 2004) includes 24 items (0: *not at all true* to 3: *definitely true*) structured in three dimensions: Callousness, Uncaring and Unemotional. The total score is the sum of the raw scores as reported by the teachers for this study.

The *Children's Aggression Scale* (CAS; (Halperin & McKay, 2008) assesses aggressive behavior with 22 items (0: *never* to 4: *many days*) that make up the verbal aggression, aggression against objects/animals, physical aggression and use of weapons scales. The total score plus two clusters (aggression towards peers and aggression towards adults) derived from teachers' responses were also analyzed.

The *Children's Global Assessment Scale* (CGAS; (Shaffer et al., 1983) is a global measure of functional impairment as rated by the interviewer/clinician based on information from diagnostic interviews with the parents.

The *Child Adolescent Functional Assessment Scale* (Hodges, 1995) assesses the degree of functional impairment secondary to the presence of psychological problems in several contexts as rated by the interviewer/clinician after parents interview. Impairment at school, home and behavior toward others were used for the study.

Procedure

The study was approved by the Ethics Commission of Animal and Human Experimentation of the authors' institution. The school principals and the families were provided with a detailed description of the research project. The families were recruited at the schools and gave written consent. The primary teachers were asked to complete the questionnaires by the end of the school year.

To avoid reading problems, items were read by examiners. Each question was read and then, the child was given time to answer. To do so he/she had a computer screen with three circles of increasing size, indicating "*nothing*" "*a little bit*" "*a lot*". The child had to point to the circle indicating the amount of anger every situation causes to him/her or the degree he/she agrees in the way the sentence describes. The examiner wrote down in the answer sheet the child's choice. Every question presented very concrete situations.

Statistical analysis

Statistical analyses have been conducted with SPSS24 and Mplus8.3, weighted in accordance with the sample design.

Exploratory factor analysis for categorical indicators was conducted to examine the internal structure. Goodness-of-fit was evaluated using the Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI). Criteria for adequate fit included having RMSEA < .06, CFI and TLI > .90. Convergent validity was assessed through Pearson correlations between the scores of AQ and other external measures.

Results

Validity based on internal structure and internal consistency reliability

Exploratory factor analysis for categorical indicators was conducted separately for block A and block B.

Block A

First five eigen values: 5.195, 1.477, 1.183, 1.077, 0.985; scree test suggests 1 factor
Fit for the 1-factor solution: RMSEA = .051 (CI95% .043-.060), CFI = .911, TLI = .898

Table 1 shows the standardized factor loadings (* means *p*-value < .05 in bold: salient factor loadings) of items of Block A.

Table 1. Items and factor loadings of Block A

Item	Frustration tolerance factor
Item1 Get angry when told to go to sleep	**.44***
Item2 Tantrums when does not get what s/he wants	**.55***
Item3 Bad mood when does not get what s/he wants	**.56***
Item4 Angry when cannot find the toy s/he wants	**.34***
Item5 Angry when told to stop playing	**.51***
Item6 Angry when makes a mistake	**.54***
Item7 Angry when told made something wrong	**.44***
Item8 Angry when tired	**.26***
Item9 Angry when has to eat something disliked	**.55***
Item10 Always complain when someone takes his/her toys	**.43***
Item11 Angry when trouble doing something	**.59***
Item12 Angry when provoked by other child	**.55***
Item13 Has bad temper	**.69***
Item14 Gets angry easily	**.66***
Item15 Easily explodes	**.73***
Item16 Say bad thing to others	**.60***
Cronbach' alpha ($r_{\text{inter-item}}$)	.79 (.20)

The 16 items of the first block loaded onto one factor that reflectes proneness to a low threshold of frustration and it was labelled as *Tolerance to frustration* (higher scores indicating lower tolerance to frustration). The internal consistency of the direct score was good.

Block B

First seven eigen values: 7.473, 2.918, 1.632, 1.406, 1.215, 1.041, 0.914; scree test suggests 2 factors
Fit for the 2-factor solution: RMSEA = .047 (CI95% .041-.053), CFI = .923, TLI = .907

Table 2 shows the standardized factor loadings (* means *p*-value < .05 in bold: salient factor loadings) of items of Block B.

Table 2. Items and factor loadings of Block B

Item	External expression factor	Control factor
When you are angry…		
Item17 Do things to inform others I am angry	**.46***	.18*
Item18 Hide to show that I am not angry	.10	.10
Item19 Prefer to be alone	**.28***	.03
Item20 Feel like crying	**.41***	−.00
Item21 Slam	**.62***	.01
Item22 Argue	**.55***	.02
Item24 Give back what they do	**.61***	−.10
Item32 Swear	**.83***	−.01
Item33 Insults	**.77***	−.19*
Item34 Hit or kick	**.72***	−.15*
Item35 Break things	**.45***	−.20
Item36 Say ugly things	**.80***	−.13*
Item37 Explode, lose control and scream	**.84***	.13*
Item38 Hit the wall or bite	**.63***	−.11
Item39 Do things to punish yourself	**.37***	.14
Item40 Lose control	**.81***	.07
Item23 Tell to someone	.16*	**.30***
Item25 Try to calm down	.01	**.61***
Item26 You hold even wanting to hit someone	−.39*	**.55***
Item27 You hold even wanting to insult	−.36*	**.55***
Item28 Breathe deeply to calm yourself	−.14*	**.63***
Item29 Count until 10	−.16*	**.49***
Item30 Try to relax	.08	**.83***
Item31 Do thing to calm yourself	−.00	**.73***
Cronbach' alpha ($r_{\text{inter-item}}$)	.80 (.24)	.72 (.26)
Factor correlation	−.25*	

The 24 items of the second block loaded onto two factors that reflected the type of responses children give when they are angry or when they are out of control. The two factors were labelled as *External expression* of anger and *anger control*. Higher scores indicate higher

external expression of anger and higher control. Both direct scores showed good or acceptable internal consistency.

Table 3. Pearson's correlation (N = 455-505) between the Anger scores and external measures

Instrument	Measure at age 6	Frustration tolerance	External expression	Anger Control
Psychopathology				
SDQ	Emotion	.09	.12	−.04
	Conduct	.18	.24	−.16
	Hyperactivity	.24	.28	−.12
	Peer	.05	.12	−.08
	Prosocial	.20	.22	−.14
	Total	.21	.28	−.14
CBCL	Anxious/depressed	.12	.19	−.08
	Withdrawn/Depressed	.04	.08	−.12
	Somatic complains	−.03	.06	.02
	Social problems	.12	.14	−.02
	Thought problems	.07	.18	−.06
	Attention problems	.15	.17	−.10
	Rule-breaking	.18	.27	−.10
	Aggressive behavior	.26	.33	−.19
	Internalizing problems	.07	.15	−.07
	Externalizing problems	.25	.34	−.18
	Total	.18	.25	−.12
DICA-PPYC	ADHD (yes/no)	.06	.16	−.04
	ODD (yes/no)	.17	.20	−.08
	Any anxiety disorder (yes/no)	.13	.06	−.05
	Any disorder (yes/no)	.15	.15	−.18
	Comorbidity (yes/no)	.11	.14	−.10
Aggressive behavior				
ICU	Callousness	.14	.15	−.21
	Uncaring	.20	.22	−.19
	Unemotional	.03	.01	−.20
	Total	.17	.18	−.25
CAS	Verbal aggression	.24	.30	−.16
	Aggression against objects and animals	.17	.29	−.01
	Provoked physical aggression	.13	.22	−.10
	Initiated physical aggression	.09	.20	−.05
	Aggression towards peers	.21	.27	−.14
	Aggression towards adults	.17	.26	−.16
	Physical aggression	.12	.21	−.04
	Total Index	.19	.28	−.08
Functioning				
CGAS	Functional impairment	−.21	−.25	.18
CAFAS	Functional at school	.13	.20	−.13
	Functional at home	.15	.23	−.11
	Behavior toward others	.19	.27	−.14

CAS: Children's Aggression Scale; CAFAS: Child Adolescent Functional Assessment Scale; CBCL: Child Behavior Checklist; CGAS: Children's Global Assessment Scale; ICU: Inventory of Callous-Unemotional Traits; DICA-PPYC: Diagnostic Interview for Children and Adolescents for Parents of Preschool and Young Children; SDQ: Strengths and Difficulties Questionnaire.

Convergent Validity based on relations to external variables

Associations with psychopathology

Table 3 shows Pearson's correlation coefficientss between the scores of Anger questionnaire and other external measures. Scores in tolerance to frustrations were correlated ($r \geq .20$) with SDQ hyperactivity, total and prosocial difficulties, and CBCL aggressive behaviour and externalizing. Higher scores in external expression of anger were correlated ($r \geq .20$) with higher SDQ hyperactivity, total, conduct and prosocial difficulties, and CBCL externalizing, aggressive behaviour, rule-breaking and total. Scores in Anger control obtained the highest associations (below $r = .20$) with SDQ conduct, prosocial difficulties and total, and CBCL aggressive behaviour and externalizing.

The highest association between the three Anger scores and DSM-5 diagnosis were obtained with oppositional defiant disorder (ODD) ($r = .20$) and, at a lower extent, between any disorder and tolerance to frustration, between ODD, ADHD, any disorder and comorbidity with external expression of anger, and between any disorder and anger control (Table 3).

Association with aggressive behaviour

Higher scores in tolerance to frustrations were correlated ($r \geq .20$) with higher ICU Uncaring and CAS verbal aggression, and aggression to peers (Table 3). Scores in external expression were positively associated with ICU uncaring and with all the CAS scales. Anger control correlated inversely with high scores in all the ICU scales (the highest association with CAS was with verbal aggression and aggression towards adults, with a value of $r = –.16$).

Association with functional impairment

All AQ scores indicating difficulties were correlated with lower CGAS functioning (*$r = –.21$ to $r = –.25$)* (Table 3). Tolerance to frustration was mainly associated to CAFAS behaviour towards others. High external expression of anger related with difficulties at school, at home and in the behaviour toward others. Scores in anger control were the least associated with CAFAS functioning.

Conclusion

This brief report wanted to show the psychometric properties of the AQ, a questionnaire developed for filling the gap of measuring anger as self-reported by young children. The results support a one-dimensional structure reflecting tolerance to frustration for block A items, and a two-dimensional structure for block B items, showing two kinds of behaviours children do when they are angry: express anger or control anger. All the scores had acceptable internal consistency.

Additionally, the AQ scores show convergence, although low in general, with measures reported by different informants (parents or teachers) that are consistent with difficulties in anger control, such as ADHD, conduct problems, ODD, externalizing problems, aggressive behaviour and callous unemotional traits. The higher the difficulties with anger, the higher the difficulties in daily functioning.

The AQ questionnaire can be used to assess anger as reported by young children with psychometric guarantees.

References

Achenbach, T. M., & Rescorla, L. A. (2001). *Manual for the ASEBA school-age forms & Profiles*. Burlington, VT: University of Vermont, Research Center for Children, Youth & Families.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Association.

Ezpeleta, L., de la Osa, N., & Doménech, J. M. (2014). Prevalence of DSM-IV disorders, comorbidity and impairment in 3-year-old Spanish preschoolers. *Social Psychiatry and Psychiatric Epidemiology, 49*(1), 145-155. doi: 10.1007/s00127-013-0683-1

Ezpeleta, L., Osa, N. d. l., Granero, R., Doménech, J. M., & Reich, W. (2011). The Diagnostic Interview for Children and Adolescents for Parents of Preschool and Young Children: Psychometric Properties in the general Population. *Psychiatry Research, 190*, 137-144. doi: 10.1016/j.psychres.2011.04.034

Frick, P. J. (2004). The Inventory of Callous-Unemotional traits. from http://psyc.uno.edu/Frick%20Lab/ICU.html

Goodman, R. (2001). Psychometric properties of the Strenghts and Difficulties Questionnaire. *Journal of the American Academy of Child and Adolescent Psychiatry, 40*, 1337-1345. doi: 10.1097/00004583-200111000-00015

Halperin, J. M., & McKay, K. E. (2008). *Children's Aggression Scale*. Lutz, FL: Psychological Assessment Resources.

Hodges, K. (1995). *Child and Adolescent Functional Assessment Scale*. Ypsilanti, MI: Eastern Michigan University, Department of Psychology.

Kerr, M.A. & Schneider, B.H. (2008). Anger expression in children and adolescents: A review of the empirical literature. *Clinical Psychology Review, 28, 4, 559-577.*

Norwood, S. (2007). Validity of self-reports of psychopathology from children of 4-11 years of age. *Vulnerable Children and Youth Studies*, *2*(2), 89–99.

Quay, H.C. & La Greca, A.M. (1986). Disorders of anxiety, withdrawal and dysphoria. In .C. Quay & J.S. Werry (Eds.) Psychopathological disorders of children (3rd ed. Pp., 77-110). New York: Wiley.

Shaffer, D., Gould, M. S., Brasic, J., Ambrosini, P., Fisher, P., Bird, H., & Aluwahlia, S. (1983). A Children's Global Assessment Scale (CGAS). *Archives of General Psychiatry, 40*, 1228-1231. doi: 10.1001/archpsyc.1983.01790100074010