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## An alexithymia questionnaire for children: Factorial and concurrent validation results

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### Abstract

Alexithymia refers to a limited ability to identify and communicate one's feelings, which has been frequently associated with physical health complaints and negative moods. The many studies that have been conducted with adults have identified three core factors in alexithymia: Difficulty Identifying Feelings, Difficulty Describing Feelings and Externally-Oriented thinking. This three-factor structure of alexithymia was also identified in children of two age groups (740 children recruited from primary schools (mean age 11 years) and secondary schools (mean age 13 years)), although the factor Externally-Oriented Thinking showed low factor loadings and a low reliability. The predictive value of the questionnaire was also satisfactory. Consistent with the adult literature, the results showed that the factors Difficulty Identifying Feelings and Difficulty Describing Feelings contributed to the prediction of self-reported somatic complaints in children, but the factor Externally-Oriented Thinking failed to do so. Directions for future research aiming at measuring alexithymia are discussed.

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## 1. Introduction

Alexithymia refers to a limited ability to recognise one's own emotions and verbalise them (Sifneos, 1996), but besides these core features, alexithymia also involves an impairment to distinguish bodily sensations stemming from an emotional arousal, an impoverished fantasy life and an external cognitive style (Haviland & Reise, 1996). The concept has been widely studied among adults, because it is seen as a risk factor for a wide range of medical or health related problems (Bagby, Parker, & Taylor, 1994). Surprisingly, alexithymia in children has scarcely been investigated, even though it is assumed to be a personality trait that might be present in childhood. Yet, better knowledge concerning alexithymia in childhood could improve our understanding of its development during lifespan. Only one study addressed the attempt to develop an (Japanese) alexithymia questionnaire for children, which was designed for completion by their teachers (Fukunishi, Yoshida, & Wogan, 1998), but a self-report instrument for the assessment of alexithymia in children is still absent, which is the focus of this study.

The 20-item Toronto Alexithymia Scale, referred to as TAS-20, is the most widely used self-report questionnaire to measure alexithymia in adults. Despite the fact that the alexithymia concept covers more features (Haviland & Reise, 1996), the TAS-20 only consists of three factors that are supposed to represent three core features: (a) Difficulty Identifying Feelings, (b) Difficulty Describing Feelings and (c) Externally-Oriented Thinking, which refers to “a cognitive style that shows a preference for external detail of everyday life rather than thought content related feelings, fantasies and other aspects of a person's inner experiences” (Bagby et al., 1994, p. 31). The reliability and appropriateness of this three-factor structure have been established in several studies in the context of clinical and nonclinical adult populations, although there are also many studies in which only a two-factor structure was observed (see Kooiman, Spinhoven, & Trijsburg, 2002, for an extensive overview). Overall, the first two factors, “Difficulty Identifying Feelings” and “Difficulty Describing Feelings” show good psychometric properties, but the third factor “Externally-Oriented Thinking” appears to be weak. Also the construct validity has repeatedly been investigated. As was expected, the TAS-20 correlates positively with self-reported physical symptoms and negatively with a perceived level of health in nonclinical adult populations (Bach, Bach, & de Zwaan, 1996; Taylor & Bagby, 2000), although the correlation with the third factor “Externally-Oriented Thinking” is not always evident when the three-factors are taken separately (De Gucht, Fischler, & Heiser, 2004; Grabe, Spitzer, & Freyberger, 2004; Lumley, Oviess, Stettner, Wehmer, & Lakey, 1996).

Furthermore, it is assumed that people with alexithymia can identify their own mood states, but fail to identify emotions, because they do not link their affective condition to specific situations, memories or expectations (Taylor, 1999). A clear distinction here is made between *moods* (global affective states without a cause, object or onset) and *emotions* (affective states that are directly linked to a specific event or situation) (Frijda, 1991). It is assumed that alexithymic people fail to analyse the situation in a way that helps them to deal with their emotions adaptively. Insufficient analyses of the causes of their affective states also negatively affect their coping potential and their negative feelings continue. This continuation of negative feelings and of the corresponding physical changes that stem from an emotional arousal explain the predominantly negative mood states and increased self-reported physical symptoms that characterise alexithymic people. The predicted positive association of the TAS-20 with negative mood states, as well as a negative cor-

relation with positive mood states is well established in nonclinical populations (Lundh & Simonson-Sarnecki, 2001; Suslow & Junghanns, 2002). When investigated separately however, again the third factor does not show the expected association with negative moods (De Gucht et al., 2004; Lumley et al., 1996).

The objective of the present study was to develop an alexithymia questionnaire for children and examine its factor structure and concurrent validity. In order to ensure a certain continuity and comparability between instruments for adults and children, we chose to base the questionnaire for children on the most widely used questionnaire for adults, the TAS-20. The items of the TAS-20 were rewritten for children—with the explicit permission from the three authors, Bagby, Parker and Taylor—and the children's questionnaire was administered among primary schoolchildren, group 6, 7 and 8 and secondary schoolchildren group 1 and 2.

First, if the three alexithymic personality characteristics that are reflected by the TAS-20 already appear in childhood, no differences between primary and secondary school children should be found with respect to the fit of the three-factor structure. If, on the other hand, a certain degree of alexithymia has to be regarded as a developmental characteristic in young children and, therefore, is a feature of young children by definition, we may anticipate a lack of discriminative power during the early years. Consequently, we would expect the three-factor model to represent the responses of the secondary schoolchildren more adequately than the response pattern of the younger children. Second, if alexithymia can be identified in children, the alexithymia questionnaire should show a negative relationship with a self-reported positive mood state (happiness) and positive relationships with self-reported negative mood states (anger, sadness and fear) and the number of self-reported health complaints.

## 2. Method

### 2.1. Participants

In this study, 740 children (mean age 12 years and 4 months; range 9 years and 6 months to 15 years and 1 month) were asked during class to fill out the questionnaires. Participants were drawn from various primary and secondary schools in the Netherlands. The primary school group comprised 400 children (207 boys, 193 girls, mean age 11 years and 2 months, standard deviation 10 months for both sex groups). The secondary school group comprised 340 children (173 boys and 167 girls, mean age 13 years and 7 months, standard deviation 7 months for both sex groups). Parental consent was obtained for all participants.

### 2.2. Material

#### 2.2.1. Alexithymia questionnaire for children

Consistent with the original adult questionnaire for alexithymia (TAS-20) developed by Bagby et al. (1994), our alexithymia questionnaire for children consisted of 20 items, representing 3 factors (see Appendix A): Difficulty Identifying Feelings (DIF, 7 items), Difficulty Describing Feelings (DDF, 5 items) and Externally-Oriented Thinking (EOT, 8 items). With the permission of the three authors of the TAS-20, their original English version for adults was translated into Dutch by

the first author of this paper. It was then sent to a co-operating primary school, where one teacher first rephrased the items in a way appropriate for primary school-aged children. This version was discussed with the teaching staff until consensus was reached. This newly derived alexithymia questionnaire for children was then sent back to the first author who backtranslated the items and compared them with the original English version for adults. If the content of an item had changed, additional revisions were made. The final version was sent to the co-operating school again for their approval. A translation of the Dutch items for children into English can be found in [Appendix A](#). Item 6, 13 and 14 are identical to the items of the original TAS-20, but the other items were reformulated. An example of an item in the original TAS-20 is “It is difficult for me to find the right words for my feelings”. The corresponding item in the alexithymia questionnaire for children is “I find it difficult to say how I feel inside”. Children were instructed to score each item on a three-point response scale (0 = not true; 1 = a bit true; 2 = true), instead of the five-point-scale that is used for the TAS-20, in order to simplify the response scale for children and provide clear verbal labels with each answer category. There is no reason to assume that less variance in the data affected the reliability or validity indices of the test scores. Scoring was reversed for five items, which were formulated positively.

### 2.2.2. *Somatic Complaint List*

Children completed the Somatic Complaints List (SCL), which had been designed for previous studies and showed good internal consistency and construct validity ([Rieffe, Meerum Terwogt, & Bosch, 2002, 2004](#)). The SCL consisted of 8 items. The instruction was “How have you been feeling lately?” Children were instructed to score each item on a three-point response scale. An example of a SCL item is “I never/ sometimes/often have a stomach ache”. The scoring was reversed for two items which were formulated positively, for example “I never/sometimes/often feel well”.

### 2.2.3. *Mood List for Children*

Children filled out a Mood Questionnaire ([Rieffe et al., 2002, 2004](#)), which consisted of 4 mood scales: happiness, anger, sadness and fear. Four items represented each mood scale. The instruction was the same as the instruction of the SCL: “How have you been feeling lately?” Children were instructed to score each item on a three-point response scale. An example of an item is “I never/sometimes/often feel angry”.

## 2.3. *Procedure*

The three questionnaires were handed out one for each participant per class. After the experimenter gave instructions in class, participants were instructed to complete the questionnaires, which took about 20 minutes per class.

### 2.3.1. *Analysis*

To test whether a three-factor structure is an adequate representation of the item responses in children, a confirmatory factor analysis (CFA) was performed. In a CFA an a priori model is fitted to the data. Firstly, we investigated whether the three-factor model is an adequate representation of the relation between the item responses, by fitting a three-factor model. Secondly, we investigated whether the three-factor model is appropriate for both age groups by fitting a number

of multi-group models. With multi-group models the invariance of a factor model can be examined by gradually imposing equality restrictions on parameters over the groups, i.e., first the three-factor model is fitted for both groups (Model 1), then an equality restriction is imposed on the factor correlations (Model 2), then an additional equality restriction is imposed on the factor loadings (Model 3), and, finally, equality restrictions are imposed on the unique variances (Model 4).

The fit of the model is evaluated by means of a chi-square statistical test. The null hypothesis underlying the test statistic is model fit, thus significance implies misfit of the model. With large sample sizes, as in the current study, minor misspecifications may lead to rejection of the model as the chi-square test becomes increasingly powerful with increasing sample size. Therefore, fit measures that are not dependent on sample size such as the ratio of chi-square and degrees of freedom ( $\chi^2/\text{df}$ ), and the root mean square error of approximation (RMSEA) should also be taken into account. The RMSEA should not exceed the .05 level. The RMSEA is accompanied by the test of close fit, which should not reach significance.

For multi-group models, a chi-square difference test can be used to test whether imposing additional restrictions leads to a significant drop of fit. This means that, for example, the difference between Model 1 and Model 2 can be tested.

## 2.4. Results

### 2.4.1. Factor structure and factorial invariance

To test whether the three-factor structure underlying the TAS-20 could also be recovered from the item responses to the children's version, a confirmatory factor analysis was performed. The fit measures for the three-factor model in the entire group are reported in Table 1. Although the chi-square value is significant, indicating misfit, the chi-square degrees of freedom ratio and the RMSEA show that the misfit is minor and the model is acceptable.

Table 1 also contains the fit measure of the multi-group models (the two age groups) and the results of the chi-square difference test. Model 1—the model specifying that the three-factor model is adequate for both groups, though the parameters may vary for the groups—has a significant chi-square, but acceptable fit measures. Thus, the three-factor structure is applicable for both age groups. The results are basically the same for Model 2. The chi-square difference test shows that the difference between Models 1 and 2 is not statistically significant. This is not the case for

Table 1  
Fit measures for the multi-group model and test of the equality of the groups

	$\chi^2$	df	<i>p</i>	$\chi^2/\text{df}$	RMSEA	Chi-square difference test				
						<i>p</i>	$\chi^2$	df	<i>p</i>	
Three-factor model	408	167	0.01	2.44	0.046	0.88				
<i>Multigroup models</i>										
Model 1	561	334	0.00	1.68	0.044	1.00				
Model 2	567	337	0.00	1.68	0.044	1.00	6	3	0.112	
Model 3	614	357	0.00	1.72	0.045	1.00	47	20	0.001	
Model 4	708	377	0.00	1.88	0.050	1.00	94	20	0.000	

Models 2 and 3 and for Models 3 and 4; the chi-square difference test shows that adding equality restrictions on the factor loading and on the unique variance lead to significant differences in fit.

The factor loadings are reported in Table 2. The factor loadings of the items relating to DIF and DDF were generally high, and all exceeded the .40 level. Only three items relating to EOT were acceptable (items 15, 16, and 20, the fact that these factor loadings were negative is arbitrary), the others approached 0.

#### 2.4.2. Reliability

The internal consistency coefficients of the scales are presented in Table 3. Consistent with other findings (Rieffe et al., 2002, 2004), the internal consistency and item homogeneity for all mood scales were good (Cronbach's alpha  $>.75$  and inter-item correlation  $>.40$ , respectively). The SCL showed an acceptable inter-item correlation of .30. The internal consistency for two scales of the alexithymia questionnaire for children was good: DIF and DDF both showed a Cronbach's alpha around .75. EOT did not meet the criteria for internal consistency nor item homogeneity.

These results for the three alexithymia scales were replicated when the primary and secondary school children's responses were analysed separately. Only the Cronbach's alpha for EOT was considerably lower for the younger than the older group (.07 and .38, respectively), although the results in the older group still failed to meet the criteria for internal consistency.

Table 2  
Factor loadings and factor correlations of the alexithymia questionnaire for children

Item	Factor 1 DIF	Factor 2 DDF	Factor 3 EOT
1	.63		
3	.42		
6	.50		
7	.58		
9	.60		
13	.54		
14	.46		
2		.77	
4		.73	
11		.49	
12		.47	
17		.60	
5			.11
8			-.13
10			-.04
15			-.54
16			-.50
18			.03
19			-.02
20			-.37
Factor 2	.72		
Factor 3	-.29		-.32

Note: GFI = .95, AGFI = .93.

Table 3

Reliability coefficients of the alexithymia questionnaire for children and mean scores as a function of age and gender

	No. items	Cronbach's alpha	Inter-item correlation	Primary school				Secondary school			
				Boys		Girls		Boys		Girls	
				M	SD	M	SD	M	SD	M	SD
SCL	8	.77	.30	12.80	2.63	13.77	2.98	12.60	2.50	13.50	2.67
<i>Four scales of the Mood Questionnaire</i>											
Happiness	4	.81	.52	2.83	.28	2.83	.30	2.78	.33	2.85	.33
Anger	4	.77	.46	1.80	.36	1.76	.34	1.83	.41	1.75	.38
Sadness	4	.80	.50	1.69	.38	1.88	.37	1.67	.43	1.80	.36
Fear	4	.77	.46	1.62	.38	1.87	.37	1.58	.41	1.74	.40
<i>Alexithymia questionnaire for children</i>											
Factor 1 DIF	7	.73	.28	1.59	.41	1.77	.46	1.44	.38	1.45	.40
Factor 2 DDF	5	.75	.37	1.83	.50	1.93	.51	1.65	.50	1.63	.55
Factor 3 EOT	8	.29	.05	1.91	.27	1.91	.26	1.85	.32	1.70	.31

### 2.4.3. Predictive validity

Table 4 shows correlations between the three-factors of the alexithymia questionnaire for children and the Somatic Check List (SCL) and the Mood Questionnaire. It can be seen that, as expected, DIF and DDF were positively correlated with the SCL and the negative emotion mood scales, whereas a positive correlation was found with Happiness. EOT did not correlate with the SCL, which could be related to its low internal consistency. However, a post-hoc test showed that also a selection of the three items that had an acceptable factor loading (items 15, 16, and 20) did not correlate with the SCL or any of the mood scales.

To investigate whether the three-factors representing alexithymia showed independent contributions to the prediction of somatic complaints, a multiple regression analysis was performed. The adjusted  $R^2$  was .23, which is fairly high (Table 5). The beta coefficients for the three factors are displayed in Table 5. It can be seen that DIF contributed most to the prediction of somatic complaints, whereas EOT did not reach significance. To check whether the low contribution of EOT was due to a lack of homogeneity of the factor, the regression analysis was repeated with the 20 items as predictors. Only two items (10 and 20) of EOT had a significant regression coefficient. However, the regression coefficient of item 20 was negative ( $\beta = -.09$ ), which indicated

Table 4

Correlation matrix alexithymia questionnaire for children with SCL and four Mood scales

	SCL	Happy	Anger	Fear	Sadness
<i>Alexithymia questionnaire for children</i>					
DIF	.48*	-.20*	.25*	.37*	.45*
DDF	.32*	-.24*	.20*	.27*	.28*
EOT	.07	-.14*	.01	.05	.03

\*  $p < .001$ .

Table 5  
Multiple regression analysis with SCL as the dependent variable

	Total group ( $n = 740$ )	Primary school ( $n = 400$ )	Secondary school ( $n = 340$ )
Adjusted $R^2$	.23	.27	.20
<i>Beta coefficients</i>			
Factor 1, DIF	.44*	.45*	.42*
Factor 2, DDF	.07*	.11*	.04
Factor 3, EOT	-.02	.00	.01

\*  $p < .05$ .

that this item did not activate the intended process. Therefore, only item 10 of EOT has incremental validity, but the beta coefficient is low (.07).

Separate analyses for the primary and secondary school children showed an adjusted  $R^2$  of .27 and .20, respectively. For both age groups, DIF contributed most to the prediction of somatic complaints, but EOT did not contribute. DDF only contributed to the prediction of self-reported somatic complaints for the youngest group (Table 5). Overall, the responses of the two age groups showed a quite similar pattern.

### 3. Discussion

The outcomes of this study suggest that core features of alexithymia can be identified in childhood. Two of the alexithymia factors (Difficulty Identifying Feelings and Difficulty Describing Feelings) showed good psychometric properties, were positively related to negative mood states and contributed positively to the prediction of self-reported somatic complaints, independently of mood states. Yet, caution should be taken when interpreting the outcomes because the third factor (Externally Oriented Thinking) showed a low reliability and validity and failed to contribute to the prediction of self-reported somatic complaints.

First, the three-factor model appeared as an acceptable representation of the alexithymia questionnaire for children and the items represented three one-dimensional factors. Moreover, the multi-groups analyses showed that the three-factor structure was applicable to both age groups, although equality restriction on the factor loadings and the unique variances indicated that there were differences at item level between the groups. The alexithymia questionnaire for children appeared to measure three separate constructs—with identical relations between those constructs—for both age groups. Yet, despite this clear three-factor structure, the factorial reliability and validity were not positive for all factors. The adequate factor loadings and high reliability showed that the factors Difficulty Identifying Feelings and Difficulty Describing Feelings are two concepts that can be clearly distinguished from each other. Consistent with the adult literature (Kooiman et al., 2002), however, the Externally-Oriented Thinking factor showed weak results because many factor loadings were low. The weakness of this factor was also visible in the low reliability coefficient and the inter-item correlations.

Second, the predictive validity of the alexithymia questionnaire for children was substantial with respect to self-reported somatic complaints and mood states. This result remained when

the two age groups were analysed separately. In accordance with other studies, higher alexithymia scores were related to more self-reported physical complaints and a negative general mood state, which can arise when feelings are not linked to specific situations. A limitation however, was that this was largely due to the contribution of the factor Difficulty Identifying Feelings. Although the factor Difficulty Describing Feelings showed substantial correlations with all dependent variables (the SCL and the four mood states), its unique contribution was lower than expected. Possibly, this was due to its rather high correlation with the Identification factor (.56). Yet, it has also been argued that this scale might measure other features, such as problems in self-disclosure caused by shame (Suslow, Arolt, & Donges, 2000). Still, this factor had its own unique contribution and proved to have additional value next to the Identification factor. Only in the older age group did the contribution of this factor to the prediction of self-reported somatic complaints drop just below the level of significance. This result and the finding that the explained variance was slightly lower in the older age group might suggest that somatic complaints better differentiate individual scores at a younger age. Further research should examine this possibility more closely.

The third factor, Externally-Oriented Thinking did not contribute to the regression model and showed no predictive value, which corresponds with findings concerning the adult questionnaire, the TAS-20 (Kooiman et al., 2002; Lumley et al., 1996). Closer inspection of this third factor reveals that the three items with a substantial loading indirectly refer to a tendency to leave emotions unanalysed. This can be linked to the avoidant way of coping that is sometimes attributed to high alexithymic people. Yet, it might be difficult to admit this avoidant attitude when one is asked directly about one's own feelings. In the group of three items, an active attitude (even purely on a mentalistic level) is contrasted with passivity. This can easily evoke an answer tendency that favours the active alternative, although it does not necessarily reflect the participants' actual behaviour. This distinction might also be apparent in adults, but the data in the adult literature has not been analysed this way. Whatever the reason, from a psychometric viewpoint, our third factor needs improvement and item substitution is indicated.

A limitation of this study might be that the data collection is based on self-report measures, which do not always reflect actual behaviour. However, alexithymia is mainly intra-psychological. This includes ideas about oneself and about one's behavioural tendencies, which are thought to be more influential in this respect than one's actual observable behavioural tendencies. Moreover, Harris (1989) argued that reflection on one's own functioning goes parallel with the actual development of that tendency, because explicit acknowledgement of one's own tendencies facilitates their use. Therefore, we want to stress that self-report questionnaires could give valuable information and provide more insights into children's emotional functioning. Nevertheless, the fact that we only used self-report questionnaires does make this study vulnerable to response tendencies and it is important to address this issue in future studies. Other indices might be valuable in this respect, such as diagnostic interviews.

In conclusion, the findings in this study indicate that alexithymia can be identified in children. It is a factor that points out individual differences in children's emotional competence and contributes substantially to the prediction of their self-reported somatic complaints. Our outcomes support the usefulness of the factor Difficulty Identifying Feelings and to a lesser extent Difficulty Describing Feelings for the identification of alexithymia in children, but the factor Externally-Oriented Thinking demonstrated severe problems. Since our problems concerning this third factor are also repeatedly replicated in samples with adults, such as in clinical samples and samples from

other countries, changing the content of the Externally-Oriented Thinking factor for the alexithymia questionnaire should be considered. Additionally, alexithymia does involve more features than those measured by the TAS-20 (Haviland & Reise, 1996). These other aspects of alexithymia might be regarded in future research and added to the operationalisation of the concept. For example, awareness of the bodily signals during an emotional arousal and the tendency to attend to and analyse one's own and others' emotions or the ability to link affective states to situational causes seem central elements of alexithymia and including these aspects in a factor structure might increase the predictive validity of a questionnaire that aims to measure alexithymia. Nevertheless, difficulties in identifying and describing feelings are shown to be associated with self-reported health problems and mood states in children. These findings could direct further research and enhance our understanding of the relationship between health and emotional competence from a developmental perspective.

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### **Appendix A. Items of the alexithymia questionnaire for children**

#### *Factor I: Difficulty Identifying Feelings*

1. I am often confused about the way I am feeling inside
3. I feel things in my body that even doctors don't understand
6. When I am upset, I don't know if I am sad, scared or angry
7. I am often puzzled by things that I feel in my body
9. Sometimes I can't find the words to say how I feel inside
13. I don't know what's going on inside me
14. I often don't know why I am angry

#### *Factor II: Difficulty Describing Feelings*

2. I find it difficult to say how I feel inside
4. I can easily say how I feel inside
11. I find it hard to say how I feel about other people
12. Other people tell me that I should talk more about how I feel inside
17. It is difficult for me to say how I really feel inside, even to my best friend

#### *Factor III: Externally-Oriented Thinking*

5. When I have a problem, I want to know where it comes from and not just talk about it
8. I'd rather wait and see what happens, instead of thinking about why things happen

10. It is important to understand how you feel inside
15. I prefer talking to people about everyday things, rather than about how they feel
16. I prefer watching funny television programmes, rather than films that tell a story about other people's problems
18. I can feel close to someone, even when we are sitting still and not saying anything
19. Thinking about how I feel, helps me when I want to do something about my problems
20. When I have to concentrate on a film to understand the story, I enjoy the film much less

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