

Development and validation of a measure of maladaptive social-evaluative beliefs characteristic of social anxiety disorder in youth: the Report of Youth Social Cognitions (RYSC)

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Development and validation of a measure of maladaptive social-evaluative beliefs
characteristic of social anxiety disorder in youth:
The Report of Youth Social Cognitions (RYSC)

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Abstract

Recent research has started to examine the applicability of influential adult models of the maintenance of social anxiety disorder (SAD) to youth. This research is limited by the lack of psychometrically validated measures of underlying constructs that are developmentally appropriate for youth. One key construct in adult models of SAD is maladaptive social-evaluative beliefs. The current study aimed to develop and validate a measure of these beliefs in youth, known as the Report of Youth Social Cognitions (RYSC). The RYSC was developed with a clinical sample of youth with anxiety disorders ($N = 180$) and cross-validated in a community sample of youth ($N = 305$). In the clinical sample, the RYSC exhibited a three-factor structure (Negative Evaluation, Revealing Self, and Positive Impression factors), good internal consistency, and construct validity. In the community sample, the three-factor structure and the internal consistency of the RYSC were replicated, but the test of construct validity showed that the RYSC had similarly strong associations with social anxiety and depressed affect. The RYSC had good test-retest reliability overall, although the Revealing Self subscale showed lower temporal stability which improved when only older participants were considered (age ≥ 9 years). The RYSC in general was also shown to discriminate between youth with and without SAD although the Revealing Self subscale again performed suboptimally but improved when only older participants were considered. These findings provide psychometric support for the RYSC and justifies its use with youth in research and clinical settings requiring the assessment of maladaptive social-evaluative beliefs.

Keywords: social anxiety disorder; social phobia; social anxiety; youth; children; beliefs; cognition; assessment.

Public Significance Statement

This study provides evidence to support the use of a new self-report questionnaire that measures maladaptive social-evaluative beliefs characteristic of social anxiety disorder in youth. The use of this questionnaire will help clinicians and researchers to better understand and assist young people with social anxiety disorder.

Development and validation of a measure of maladaptive social-evaluative beliefs
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Social anxiety disorder (SAD) is characterised by an intense fear of social-evaluative situations resulting in significant distress and interference with functioning (American Psychiatric Association, 2013). The disorder typically has onset between 10 and 20 years of age (Beesdo et al. 2007; Wittchen et al. 1999), a developmental period in which there is also an increase in perspective taking, awareness of others, and concern about how one is viewed or evaluated by others (Warren & Sroufe, 2004; Westenberg, Siebelink, & Treffers, 2001). Our understanding of SAD in adults has progressed further than our understanding of SAD in youth, in part driven by influential adult cognitive-behavioural maintenance models of the disorder (Clark & Wells, 1995; Heimberg et al., 2010; Hofmann, 2007; Moscovitch, 2009; Rapee & Heimberg, 1997; for a review, see Wong & Rapee, 2016).

The most widely cited and well-established of these models are Clark and Wells (1995) and Rapee and Heimberg (1997). Both models incorporate Beck's (Beck, 1976; Beck, Emery, & Greenberg, 1985) *content-specificity hypothesis* which states that "each psychological disorder has a distinct cognitive profile that is evident in the content and orientation of the negative cognitions and processing bias associated with the disorder" (Clark, Beck, & Alford, 1999, p. 115). As such, enduring maladaptive beliefs about the self and social situations are central to both models. Rapee and Heimberg (1997) referred generally to negative beliefs about how one is viewed by others, as well as maladaptive beliefs related to perceived high social standards, and the probability and consequences of negative evaluation from others. In contrast, Clark and Wells (1995) proposed three types of maladaptive social-evaluative beliefs and importantly provided detail about the content of these beliefs: (a) beliefs about excessively high standards for social performance (e.g., "I

have to get everyone's approval"), (b) conditional beliefs concerning the negative social consequences of one's behaviour or actions (e.g., "If I make mistakes, others will reject me") and (c) unconditional beliefs about the self which highlight generalised negative perceptions of the self that are assumed to be held by others (e.g., "People think I'm inferior"). Clark and Wells (1995) thus provide a more detailed account of the maladaptive beliefs characteristic of SAD and their framework is therefore adopted for the current study. According to Clark and Wells (1995), social-evaluative situations activate the three types of maladaptive social-evaluative beliefs. Once activated, the beliefs transform social cues into social threats and thereby generate anxiety. SAD is believed to persist because specific cognitive and behavioural maintenance processes (e.g., safety-seeking behaviours, post-event processing) reinforce maladaptive social-evaluative beliefs (Clark & Wells, 1995).

From an assessment perspective, psychometrically validated self-report measures of nearly all the hypothesised maintenance processes of SAD have been developed for adults (for a review, see Wong, Gregory, & McLellan, 2016). Additionally, several validated measures of maladaptive social-evaluative beliefs exist for adults (see Table 1). These measures have been shown to have significant positive associations with measures of social anxiety (*r*s range from .38 and .85; Boden et al., 2012; Fergus et al., 2009; Gros & Sarver, 2014; Levinson et al., 2015; Rodebaugh, 2009), with some studies also showing this relationship to be independent of depression levels (Wong & Moulds, 2011; Wong et al., 2014; Wong et al., 2017).

Insert Table 1 about here

To further understanding of SAD in youth, researchers have applied adult maintenance models of SAD to young people. However, there is a need to examine the developmental appropriateness of constructs in adult models of SAD for young people

(Schniering, Hudson, & Rapee, 2000). We focus on maladaptive social-evaluative beliefs given their centrality in adult models of SAD. There are significant developments in self-concept and cognition in youth which are likely to support the emergence of maladaptive social-evaluative beliefs and at the same time shape the nature and content of these beliefs. For example, youth as they enter middle childhood (around age 7) begin to view themselves in terms of trait-like descriptors (e.g., I am smart, happy) that become more socially-oriented (e.g., I am friendly, helpful) and complex with age (Harter, 1990). Moreover, there is evidence that children as young as 5 years can report cognitions about the anticipation of threatening outcomes related to social evaluation, and the prevalence and complexity of these cognitions increase with age (Muris, Merckelbach, & Luijten, 2002; Vasey, Crnic, & Carter, 1994). Also of relevance, there are improvements from childhood to adolescence in the social cognitive ability to infer the mental states of others (Burnett, Sebastian, Kadosh, & Blakemore, 2011). These developments in self-perceptions, the anticipation of social consequences, and mental state inference in young individuals suggest that the emergence of maladaptive social-evaluative beliefs might occur as early as middle childhood. The developments further suggest that maladaptive social-evaluative beliefs in youth are likely to be less common and less complex than such beliefs in adults. Notably, in terms of assessment, children from the age of 7 years demonstrate a level of metacognitive awareness that allows them to report on the occurrence of their own cognitions (Flavell, Green, & Flavell, 1995).

Currently in the literature, three studies to our knowledge have specifically examined social-evaluative cognitions together with other maintenance processes of the Clark and Wells (1995) model in youth. Two of these studies have utilised non-clinical high socially anxious youth (aged 11-14 years, Hodson, McManus, Clark, & Doll, 2008; aged 14-20 years, Schreiber, Höfling, Stangier, Bohn, & Steil, 2012), and the other study has utilised youth with

SAD (mean age 15.9 years, Ranta, Tuomisto, Kaltiala-Heino, Rantanen, & Marttunen, 2014). Across the three studies, based on the content of the maladaptive social-evaluative cognitions assessed, there were two main types: (a) social-evaluative cognitions that are specific and relate to discrete social-evaluative events (e.g., “I am going red”; i.e., more thought-like), and (b) social-evaluative cognitions that are generalised and applicable to a broad range of social-evaluative situations (e.g., “People think I’m boring”; i.e., more belief-like). All three studies showed that the maladaptive social-evaluative thoughts and beliefs assessed and the measured maintenance processes of Clark and Wells’ (1995) model were higher in socially anxious samples relative to comparison samples with low social anxiety. However, none of the measures of cognition used in the three studies were psychometrically validated for use in young people. Without the psychometric evaluation of assessment tools, the accuracy of measurement and interpretation of questionnaire scores, particularly in the previous three studies examining social-evaluative cognitions in the context of a model, is questionable. Furthermore, none of the measures of cognition used in the three studies were evaluated from a developmental perspective to ensure the content of questionnaire items matched the developmental level of participants (cf. Schniering et al., 2000). Interestingly, the only psychometrically validated self-report measure of social-evaluative cognitions for youth currently available is the 10-item Social Threat subscale of the Children’s Automatic Thoughts Scale (CATS; Schniering & Rapee, 2002, 2004). However, the Social Threat subscale assesses social-evaluative cognitions that relate to discrete social-evaluative events occurring in the present time (e.g., “Other kids are making fun of me”) or that will occur in the future (e.g., “Kids will think I’m stupid”). The content of the cognitions captured by the Social Threat subscale is therefore situation- and time-specific, consistent with the target construct of the CATS (i.e., automatic thoughts). Evidently, the Social Threat subscale of the

CATS does not assess the more generalised maladaptive social-evaluative beliefs described in Clark and Wells' (1995) model.

Considering the limitations within the existing literature, the current study aimed to develop and validate a new measure of maladaptive social-evaluative beliefs for youth, referred to as the Report of Youth Social Cognitions (RYSC). Given the age of 7 years appears to be a time when both maladaptive social-evaluative beliefs might emerge and metacognitive ability is sufficient to report on such beliefs, this was the lower age limit selected for the present study. Furthermore, given the prominence of the Clark and Wells (1995) model and its explicit proposal of three types of maladaptive social-evaluative beliefs, candidate RYSC items were developed in line with this model. As the RYSC is likely to be used primarily in clinical populations, we initially developed items and tested psychometric properties in a clinical sample of youth with anxiety disorders, which included youth with SAD. Psychometric evaluation included exploratory factor analysis (EFA) and an examination of item associations with social anxiety symptoms, as well as internal consistency and construct validity. We cross-validated the RYSC in a sample of youth from the community. Psychometric evaluation in this sample included confirmatory factor analysis (CFA) to test the factor structure of the RYSC obtained in the clinical sample, as well as an examination of internal consistency, test-retest reliability, construct validity, and the impact of the youngest participants (age 7 and 8 years) on the aforementioned psychometric properties. Finally, using both the clinical and community samples, and again considering the influence of the youngest participants (age 7 and 8 years), we examined the discriminative validity of the RYSC.

Method

Participants

The clinical sample consisted of 180 youth (81 females; mean age = 9.22 years, $SD = 1.59$; age range from 7 to 12 years) who sought treatment at the Centre for Emotional Health Clinic at Macquarie University during 2014 and 2015. In this sample, 84% of youth were of European descent, 66% had a primary caregiver with an undergraduate degree or higher, and 64% were from middle to high income families. Youth and a primary caregiver initially attended an assessment session where they completed a battery of measures for research, a semi-structured clinical assessment interview, and clinical assessment measures (see Measures section). Youth who met inclusion criteria (and who did not meet exclusion criteria) for the clinical trials conducted through the clinic were subsequently offered treatment. Those excluded from clinical trials were provided with appropriate referrals. All youth in the current sample met criteria for an anxiety disorder somewhere in their diagnostic profile (89% had a primary anxiety disorder; 11% had at least one anxiety disorder elsewhere in their diagnostic profile). The most common primary diagnoses included: generalised anxiety disorder (40%), social phobia (18%), separation anxiety disorder (17%), specific phobia (7%), oppositional defiant disorder (4%), and obsessive-compulsive disorder (3%). In terms of comorbidity, 84% of youth met criteria for an additional anxiety disorder, 7% met criteria for an additional mood disorder, and 7% met criteria for an additional behaviour disorder. The average number of comorbid disorders was 2.05 ($SD = 1.43$). Notably, 54% of all participants had social phobia somewhere in their diagnostic profile.

The community sample consisted of 305 youth (147 females; mean age = 9.64 years, $SD = 1.56$; age range from 7 to 14 years) who were recruited from the Sydney community. In this sample, 64% of youth were of European descent, 66% had a primary caregiver with an undergraduate degree or higher, and 55% were from middle to high income families. Recruitment was done via research advertisements sent to parents at primary schools or appearing in primary school newsletters, posted around Macquarie University, or posted on

social media. Advertisements described a research project examining the role of childhood beliefs and thoughts in the development of emotional difficulties. Participants received a small gift (stationery) and their family received a small monetary reimbursement for participating in the study. To examine test-retest reliability, 36 consecutively recruited youth from the full sample were approached to complete the RYSC for a second time. Of the 36 youth, a subsample of 32 youth (17 females; mean age = 11.13, $SD = 1.58$; age range from 8 to 14 years) successfully completed a second RYSC on average 35.44 days ($SD = 8.60$) after they were first administered the RYSC.

Measures

The Report of Youth Social Cognitions (RYSC). A researcher (first author) and a clinician (second author) on the team, both with extensive experience in the assessment of SAD in youth, generated an initial pool of 43 items. During the generation of items, the two team members considered the definitions of high standard, conditional, and unconditional beliefs (Clark & Wells, 1995), and also considered the relevance of the items for youth. Subsequent to the initial generation of items, five other researchers and clinicians on the team independently rated the items. This team of five included: three senior academics with extensive experience as practicing clinical psychologists and expertise in anxiety disorders in children/adolescents (ranging from 10 to 25 years' experience), and two postdoctoral researchers who are also current practicing clinical psychologists specialising in anxiety disorders in children/adolescents (ranging from 2 to 4 years' experience). First, the team of raters were asked to judge on a 4-point Likert scale (from 1 = *Strongly disagree* to 4 = *Strongly agree*) the extent each item reflected a maladaptive social-evaluative belief characteristic of youth with high social anxiety or SAD. It was decided a priori that in the case where an item was rated a 1 or 2 by at least 50% of the raters, it would be deleted from the item pool (see also Turner et al., 2003). Three items were subsequently removed from the

item pool. Second, raters were asked to judge on a 4-point Likert scale (from 1 = *Strongly disagree* to 4 = *Strongly agree*) the extent each item reflected a characteristic belief of youth with high anxiety more generally. Where an item was rated 3 or 4 by at least 50% of the raters, it was deleted from the item pool. This led to removal of a further five items.

The remaining 35 items were screened for readability using the Flesch-Kincaid grade level (FKGL). The measure was aimed at youth aged 7 (equivalent to 2nd Grade in the US school system) and above so items were screened using an FKGL score of < 3 (less than grade 3 level). There were 5 items that had a FKGL score > 3 (FKGLs ranged from 3.1 to 3.7) and were deleted on this basis. Following these exclusions, 30 items formed the preliminary version of the RYSC and was administered to the clinical and community samples. Youth in these samples were instructed to indicate on the RYSC how often, if at all, each thought popped into their head over the past week using a 5-point Likert scale (from 1 = *Not at all*, to 5 = *All the time*).¹

Additional measures administered to the clinical sample. Youth diagnoses were made based on the Anxiety Disorders Interview Schedule for DSM-IV - Child and Parent versions (ADIS-IV-C/P; Silverman & Albano, 1996) using interview information from both the youth and a primary caregiver. Graduate students in clinical psychology or registered psychologists conducted the ADIS-IV interviews, and all diagnostic decisions and severity

¹ There were several considerations in the development of these instructions for the RYSC. First, we considered the term 'thoughts' would be more familiar and understandable to youth than the term 'beliefs' based on our research and clinical experience with young people. Thus, we made reference to 'thoughts' in the instructions of the RYSC. Second, for the assessment of the presence of maladaptive social-evaluative beliefs in youth, we initially considered theory that indicated that these beliefs needed to be activated before they can influence the cognitive content and cognitive processing of an individual (Clark & Wells, 1995). Furthermore, we considered evidence that children from the age of 7 years demonstrate a level of metacognitive awareness that allows them to report on the occurrence of their own cognitions (Flavell et al., 1995). Asking youth participants to rate "how often, if at all, each thought popped into your head" was considered a youth-friendly way to assess how often the beliefs entered into their mind (i.e., the beliefs were a part of their cognitive content). This allowed us to assess the presence and extent of activation of the maladaptive social-evaluative beliefs. For example, beliefs that were not present and therefore not influencing cognitive content were expected to receive a low rating (e.g., thoughts popped into head 1 = *Not at all*). Similarly, beliefs that were present but not activated and therefore not influencing cognitive content were expected to receive a low rating (e.g., thoughts popped into head 1 = *Not at all*). In contrast, beliefs that were present and activated to a large extent and therefore heavily influencing cognitive content were expected to receive higher ratings (e.g., thoughts popped into head 5 = *All the time*).

ratings assigned (with scores of 4 or above indicating at least moderate impairment caused by the relevant disorder) were overseen by experienced clinical psychologists. These methods yield substantial agreement on the presence of relevant anxiety disorders anywhere in a youth's diagnostic profile as evidenced by inter-rater reliability analyses conducted on data from previous trials run through our clinic (kappas range from .77 to .93). In addition, youth in the clinical sample completed two self-report measures (for descriptive statistics and internal consistencies, see Table 2). Where appropriate, item scores on these measures were summed to produce a total score. The Spence Children's Anxiety Scale (SCAS; Spence, 1998) assessed different aspects of youth anxiety and was used for two reasons: (a) the 6-item Social Phobia subscale of the SCAS assessed youth social anxiety, and was used to assist in the selection of final RYSC items (i.e., items in the final RYSC needed to have significant positive correlations with the Social Phobia subscale of the SCAS), and (b) one item from the SCAS that assessed general worry ("*I worry about things*") was used to test construct validity. The 10-item Social Threat subscale of the Children's Automatic Thoughts Scale (CATS; Schniering & Rapee, 2002) assessed negative automatic thoughts in relation to the social domain that are common in youth with internalising problems, and was also used to test construct validity.

Additional measures administered to the community sample. There were two main measures (for descriptive statistics and internal consistencies, see Table 2). Two subscales from the Social Anxiety Scale for Children - Revised (SASC-R) assessed youth social anxiety (La Greca & Stone, 1993): the 6-item Social Avoidance and Distress-New subscale (i.e., social anxiety in relation to new situations or unfamiliar peers) and the 4-item Social Avoidance and Distress-General subscale (i.e., social anxiety experienced more generally in relation to peers). Given scores on the two subscales were highly correlated ($r = .59$) and had good reliability separately (see Table 2) and together (Cronbach's $\alpha = .85$), the

subscale scores were summed to create an index of social anxiety. Additionally, scores on 5 items that tap depressed mood from the Centre for Epidemiological Studies Depression Scale for Children (CES-DC; Fendrich, Weissman, & Warner, 1990) were summed to produce an index of depressed affect. Both the social anxiety index and the depressed affect index were used to test construct validity.

Insert Table 2 about here

Procedure

The study procedures were approved by the Macquarie University Human Research Ethics Committee. For the clinical sample, a primary caregiver provided separate written consent for the administration of a research questionnaire battery and the clinical assessment at the Centre for Emotional Health Clinic. The primary caregiver participated in a clinical interview that centred on their child. Youth provided verbal assent at the time of their assessments. Youth completed the RYSC as part of the research questionnaire battery (in random order with other measures not used in the current study), completed their clinical interview, and then completed the SCAS and CATS as part of a clinical assessment battery (also in random order with other measures not used in the current study). Youth were subsequently entered into a treatment trial (depending on the trial's inclusion/exclusion criteria) or were referred on.

For the community sample, written parental consent and youth assent were first obtained. Youths then completed the RYSC, SASC-R, and CES-DC (along with other measures not utilised in the current study) in a random order. Youths in the test-retest subsample completed the RYSC again approximately one month later (average 35.44 days, $SD = 8.60$). Measures were completed either at the youth's school or at Macquarie University. In cases where the study was completed in schools, relevant prior approval from

the state education department and the school was obtained as necessary. Notably, care was taken to ensure that youth recruited into the clinical sample were also not recruited into the community sample.

Results

Preliminary analyses for the clinical sample

Missing data. There were no missing data for the initial 30-item version of the RYSC. However, only 138 out of the 180 participants (77%) completed the SCAS and CATS.²

Distribution of variables. RYSC items had skew and kurtosis within normal limits (i.e., all absolute skew values < 3 and absolute kurtosis values < 8 ; Kline, 2011), except one item (*“If other kids get to know me, they won’t like me”*; kurtosis = 8.57).

Item-total and inter-item correlations. Correlation coefficients between each item score and the total score of the RYSC (based on 30 items) were calculated. We planned to exclude items with an item-total correlation less than .40. All item-total correlations were $> .48$. Inter-item correlations were also calculated so that potential content overlap of item pairs with correlations $> .70$ could be examined. There were five such item pairs (inter-item correlations ranged from .71 to .77). One item from each item pair was dropped. To decide which item would be dropped from each pair, we examined the average inter-item correlation of the items. The item with the average inter-item correlation closer to the optimal range of .20 to .40 (Briggs & Cheek, 1986) was kept. Thus, 5 items were removed, leaving 25 items for further evaluation.

² Participants completed the RYSC as part of a questionnaire battery for research, completed a clinical interview, and then completed the SCAS and CATS as part of a clinical assessment battery. It was typical for youth to complete the questionnaire battery for research (including the RYSC). However, after their clinical interview, some youth did not continue on to treatment at our clinic (e.g., did not meet all inclusion criteria of trial, sought treatment elsewhere) and so did not complete the clinical assessment battery (including the SCAS and CATS). These factors contributed to the missing SCAS and CATS data. Importantly, there were no differences in age or RYSC total score (based on 30 items) between participants who completed the SCAS and CATS and those who did not ($ps > .129$).

Derivation of the final version of the RYSC in the clinical sample: Exploratory factor analysis and item correlations with social anxiety

Selection of final RYSC items was based on the simultaneous examination of: (a) factor loadings from EFA, and (b) item correlations with social anxiety symptoms. Prior to EFA, following recommendations in the literature (O'Connor, 2000), parallel analysis and Velicer's Minimum Average Partial (MAP) test were conducted on the 25 remaining items of the RYSC. Both the MAP test and parallel analysis indicated 3 factors should be extracted. Hence, an EFA with promax rotation was conducted with 3 factors specified. In support of the suitability of the RYSC for factor analysis procedures, Bartlett's test of sphericity was significant ($\chi^2(300) = 2994.84, p < .001$), and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (KMO = .93) was above the suggested minimum of .60. The three-factor solution explained 60.70% of the variation in scores on the 25 items. Considering strong factor loadings only ($\geq .50$), 11 items loaded on to the first factor, 5 items loaded on to the second factor, and 4 items loaded on to the third factor. There were no double-loading items.

Given the aim was to include items with strong factor loadings ($\geq .50$) and strong correlations with social anxiety in the final version of the RYSC, only items meeting these criteria were retained. These criteria led 14 items to be retained for the final version of the RYSC (see Table 3). These 14 items had: (a) factor loadings $\geq .50$ from the EFA, and (b) significant positive associations with the Social Phobia subscale of the SCAS (r s ranged from .16 to .32, all p s $< .05$). In total, 11 out of the 25 items were excluded from this part of the item selection process (3 items because they had factor loadings below .50, 6 items because they had non-significant associations with the Social Phobia subscale of the SCAS, and 2 items because they had factor loadings below .5 and non-significant associations with the Social Phobia subscale of the SCAS; see Table 3).

Items that loaded on to Factor 1 suggested that the factor reflects maladaptive beliefs encompassing negative evaluation from others (henceforth referred to as the Negative Evaluation factor). Items that loaded on to Factor 2 suggested that the factor reflects maladaptive beliefs about revealing one's self to others and the negative social consequences that ensue (henceforth referred to as the Revealing Self factor). Finally, items that loaded on to Factor 3 suggested that the factor reflects maladaptive beliefs about the need to make a positive impression on others (henceforth referred to as the Positive Impression factor). From the EFA, the factors had strong positive associations (Factor 1 and 2 $r = .72$; Factor 1 and 3 $r = .59$; Factor 2 and 3 $r = .65$). All remaining analyses used the final 14-item version of the RYSC. Scores of items on the same factor were summed to produce subscale scores, and subscale scores were summed to produce the RYSC total score.

Insert Table 3 about here

Internal consistency in the clinical sample

The RYSC total score and each subscale score had good internal consistency (see Table 4).

Insert Table 4 about here

Construct validity in the clinical sample

Tests of the difference between correlations (Steiger, 1980) showed, as expected, that the RYSC total and each subscale had significantly stronger associations with the Social Threat subscale of the CATS than with the worry item of the SCAS (all $Zs > |3.06|$, all $ps < .002$; see Table 5).

Insert Table 5 about here

Preliminary analyses for the community sample

Missing data. There were no missing data for the RYSC. However, 300 out of the 305 participants (98%) completed the SASC-R and CES-DC.

Distribution of variables. All RYSC items had skew and kurtosis values within normal limits (i.e., all absolute skew values < 3 and absolute kurtosis values < 8 ; Kline, 2011).

Confirmatory factor analysis in the community sample

CFA with maximum likelihood extraction was conducted to test the three-factor model for the RYSC derived from the clinical sample, as well as a competing and more parsimonious one-factor model. To evaluate model fit, the following fit indices were used (Brown, 2006): the chi-square statistic (χ^2 ; smaller values indicate better fit), the comparative fit index (CFI; values $\geq .90$ suggest acceptable fit; higher values indicate better fit), the non-normed fit index (NNFI; values $\geq .90$ suggest acceptable fit; higher values indicate better fit), the root mean square error of approximation (RMSEA; values $\leq .08$ suggest acceptable fit; lower values indicate better fit), the standard root mean square residual (SRMR; values $\leq .08$ suggest acceptable fit; lower values indicate better fit), and the Akaike information criterion (AIC; smaller values indicate better fit and a greater likelihood of model cross-validation). A test of the difference in χ^2 was used to examine the difference in fit between the three-factor and one-factor models.

All fit indices for the three-factor model in the full community sample were better than recommended cut-off values, indicating acceptable model fit (see Table 6). In contrast, the fit of the one-factor model was poor. Similar fit indices were obtained when 7- and 8-year old participants were removed from the full sample (see Table 6), suggesting younger participants did not substantially impact model fit in the full sample. In both the full sample and the subsample with 7- and 8-year old participants removed, the three-factor model

provided significantly better fit to the data relative to the one-factor model (full sample: $\chi^2(3) = 150.71, p < .001$; subsample: $\chi^2(3) = 87.69, p < .001$).

Insert Table 6 about here

Internal consistency in the community sample

The RYSC total score and each subscale score had good internal consistency in the full community sample (see Table 4). Similar results were obtained when 7- and 8-year old participants were removed from the full sample (see Table 4), suggesting younger participants did not substantially impact internal consistency in the full sample.

Test-retest reliability in the community sample

The test-retest subsample ($n = 32$) did not significantly differ with the rest of the community sample on gender ratio, the SASC-R, or the RYSC (all $ps > .091$). However, the subsample was significantly older ($F(1,303) = 36.20, p < .001$), and had significantly lower levels of depressed mood ($F(1,298) = 4.28, p = .040$), compared with the rest of the community sample. Using intraclass correlation coefficients (ICCs) as indicators of test-retest reliability (McGraw & Wong, 1996), and a recommended minimum ICC of .70 (Terwee et al., 2007), the RYSC total score, Negative Evaluation subscale score, and Positive Impression subscale score all had acceptable temporal stability in the test-retest subsample (see Table 4). The Revealing Self subscale score in contrast had problematic temporal stability (ICC = .64). After younger participants were removed from the test-retest subsample (i.e., 8-year old participants only; there were no 7-year-olds), the RYSC total score and subscales scores all had acceptable ICCs indicating temporal stability (see Table 4).

Construct validity in the community sample

As expected, the RYSC total and subscales each had significant positive associations with the measure of social anxiety (SASC-R) as well as the measure of depressed affect

(CES-DC) in both the full community sample and the community subsample with 7- and 8-year-olds removed (see Table 5). Somewhat unexpectedly, tests of the difference between the correlations (Steiger, 1980) showed that the RYSC total was similarly related to the measure of social anxiety and the measure of depressed affect in both the full sample and subsample (full sample: $Z = 1.46$, $p = .145$; subsample: $Z = 1.09$, $p = .277$). Along similar lines, each of the RYSC subscales were similarly related to the measure of social anxiety and the measure of depressed affect (full sample: all $Zs < |1.73|$, all $ps > .084$; subsample: all $Zs < |1.58|$, all $ps > .115$).

Discriminative validity

Given the comorbidity in the clinical sample, SAD was considered to be sufficiently influential if it was one of the top three diagnoses. Thus, a subsample of youth from the clinical sample who had SAD as one of their top three diagnoses ($n = 89$) was compared against: (a) youth from the clinical sample who did not have SAD anywhere in their diagnostic profile ($n = 83$), and (b) youth from the community sample who were unlikely to have a SAD diagnosis because they scored less than the mean on the measure of social anxiety administered ($n = 150$). A multivariate ANOVA indicated that there were significant differences in the RYSC total score and subscale scores between the three groups (see Table 7). All follow-up comparisons utilised Bonferroni-corrected p -values. Clinical sample youth with SAD had a significantly higher RYSC total score, Negative Evaluation subscale score, and Positive Impression subscale score, compared to clinical sample youth without SAD (all $ts > |2.44|$, all $ps < .046$), and compared to community sample youth with a low probability of SAD (all $ts > |4.40|$, all $ps < .001$). Notably, clinical sample youth with SAD did not significantly differ from clinical sample youth without SAD on the Revealing Self subscale score ($t(319) = 1.73$, $p = .253$), although both these groups had a significantly higher

Revealing Self subscale score relative to community sample youth with a low probability of SAD (all $t_s > |3.37|$, all $p_s < .003$).

After 7- and 8-year-old participants were removed from each subsample, there were still significant differences in the RYSC total score and subscale scores between the three groups (see Table 7). However, there was a noticeable change in the pattern of results for the follow-up analyses. Clinical sample youth with SAD had significantly higher scores on the RYSC total and all subscales compared to clinical sample youth without SAD (all $t_s > |2.74|$, all $p_s < .020$), and compared to community sample youth with a low probability of SAD (all $t_s > |3.84|$, all $p_s < .001$).

Insert Table 7 about here

Discussion

This study aimed to develop and validate a new developmentally appropriate measure of maladaptive social-evaluative beliefs for youth referred to as the RYSC. EFA in a clinical sample showed that the RYSC was composed of three factors corresponding to maladaptive beliefs about: (a) negative evaluation from others (Negative Evaluation factor), (b) revealing the self to others and the associated negative consequences (Revealing Self factor), and (c) needing to convey a positive impression to others (Positive Impression factor). The RYSC total and its subscales in the clinical sample had good internal consistency, and demonstrated construct validity (i.e., stronger associations with a measure of social-evaluative automatic thoughts than with a measure of worry). In the community sample, the three-factor model of the RYSC demonstrated good fit with the data, and showed significantly better fit relative to a competing one-factor model. The RYSC total and its subscales also had good internal consistency and test-retest reliability overall, although the Revealing Self subscale showed relatively lower temporal stability than the other subscales. The temporal stability of the

Revealing Self subscale was better in older participants (i.e., age ≥ 9 years). Interestingly, in terms of construct validity, the RYSC total and its subscales had significant positive associations with a measure of social anxiety and a measure of depressed affect, and these associations were similar in magnitude. Finally, in terms of discriminative validity, the RYSC total score, Negative Evaluation subscale score, and Positive Impression subscale score distinguished clinically anxious youth with SAD from clinically anxious youth without SAD and community sample youth with a low probability of SAD. The Revealing Self subscale score distinguished clinically anxious youth with SAD from community sample youth with a low probability of SAD, but not clinically anxious youth without SAD. In older participants (i.e., age ≥ 9 years), however, the Revealing Self subscale differentiated clinical sample youth with SAD from clinical sample youth without SAD and community sample youth with a low probability of SAD. Overall, these findings provide psychometric support for the RYSC.

The results in relation to the factor structure of the RYSC deserve elaboration. Consistent with theory (Clark & Wells, 1995) and research (e.g., Wong et al., 2014) on the three types of maladaptive social-evaluative beliefs in adults (high standard, conditional, and unconditional beliefs), the current study identified a set of beliefs in youth subsumed under the Positive Impression factor of the RYSC and another set of beliefs in youth subsumed under the Negative Evaluation factor of the RYSC. The Positive Impression beliefs in youth correspond with high standard beliefs in adults, in that they all emphasise the need to convey a positive impression to others. The Negative Evaluation beliefs in youth correspond with unconditional beliefs in adults, in that they all emphasise negative evaluation from others. Against Clark and Wells' (1995) conceptualisation and related research, however, beliefs subsumed under the Revealing Self factor of the RYSC appear to highlight a theme that is different in nature to conditional beliefs in adults. Conditional beliefs in general have an *if then* structure and in the context of social anxiety highlight negative social consequences that

are dependent on one's behaviour or actions (e.g., "If I don't get everything right, I'll be rejected"; Clark & Wells, 1995). Although the Revealing Self factor contained three beliefs with *if then* structures, the overarching theme of the beliefs focuses on not revealing the self to others and the negative social evaluation that would ensue if one did reveal aspects of themselves. This result, although unexpected, is actually in line with more recent findings from research that has expanded on the types of maladaptive social-evaluative beliefs held by adults with SAD. Such research has emphasised the relevance of beliefs about needing to hide aspects of one's self due to fear of evaluation of the self (Levinson et al., 2015; Rodebaugh, 2009).

The Revealing Self beliefs of the RYSC are also interesting from a developmental and psychometric perspective. The current study showed that the Revealing Self subscale had suboptimal psychometric properties in initial analyses of test-retest reliability and discriminative validity. However, these psychometric properties improved when analyses were re-run with participants aged 9 years and older. This suggests that maladaptive beliefs about revealing the self may only be appropriately assessed in older children. Although research indicates that youth in middle childhood have a sense of self in terms of trait-like descriptors (Harter, 1990), it may be the case that maladaptive beliefs about revealing the self may only emerge with further cognitive development and understanding of the self and others. Notably, the Negative Evaluation and Positive Impression subscales of the RYSC had good psychometric properties across the full age range of participants in the current study.

The results in relation to the construct validity of the RYSC also deserve further consideration. Although the construct validity results of the RYSC in the clinical youth sample were consistent with expectations, the construct validity results of the RYSC in the community youth sample were somewhat unexpected. Given candidate RYSC items were designed and evaluated by our team so that items had specific relevance to SAD, we had

expected that the RYSC and its subscales that passed psychometric testing in the clinical youth sample would show larger positive associations with a measure of social anxiety than with a measure of depressed affect in the community youth sample. Instead, the RYSC and its subscales showed positive associations with both social anxiety and depressed affect that were similar in magnitude. This result is consistent with research that has shown that certain types of maladaptive social-evaluative beliefs in adults are similarly related to both social anxiety and depression levels (e.g., unconditional beliefs of the SBSA, Wong et al., 2014; contingent beliefs of the CBQ, Wong et al., 2017; cf. Table 1). At the same time, our result contrasts with research that has shown other maladaptive social-evaluative beliefs in adults are more strongly related to social anxiety than depression (e.g., high standard beliefs and conditional beliefs of the SBSA, Wong et al., 2014; beliefs about others of the CBQ, Wong et al., 2017). One possible explanation for the unexpected results in our community youth sample then is that the maladaptive social-evaluative beliefs as captured by the RYSC are a vulnerability factor for both social anxiety and depression. SAD and major depression commonly co-occur in both adults (e.g., Ohayon & Schatzberg, 2010) and in youth (e.g., Chavira, Stein, Bailey, & Stein, 2004), and evidence indicates common cognitive components to both disorders in adults (e.g., Cox et al., 2000; Dozois & Frewen, 2006). Further research is needed to test this belief vulnerability hypothesis using longitudinal designs.

Other important directions for future research using the RYSC should be highlighted given the overall promising psychometric properties of the measure. In terms of research, the RYSC will be important in future studies that further examine the applicability of adult SAD maintenance models to youth (e.g., Hodson et al., 2008), and future studies that test existing aetiological models of SAD (e.g., Wong & Rapee, 2016). In particular, the RYSC will be useful in capturing maladaptive social-evaluative beliefs relevant to youth and testing how these beliefs develop and interact with other SAD model components. Following the adult

SAD literature (e.g., Boden et al., 2012; Rapee et al., 2009), another important future research direction will be to use the RYSC as an outcome measure in evaluations of treatment programs for youth with SAD and for testing whether change in maladaptive social-evaluative beliefs are a mediator of social anxiety symptom change in such programs. In terms of clinical applications, the RYSC will be useful for clinicians in determining the types of maladaptive social-evaluative beliefs that might need to be targeted in youth seeking assistance for SAD.

Some limitations of the current study should be noted. First, we used the Clark and Wells (1995) framework to develop candidate maladaptive social-evaluative beliefs for the RYSC. Although this framework is comprehensive, it is possible that there are types of maladaptive social-evaluative beliefs relevant to SAD that are not captured by this framework and so were not considered during item generation. Second, we conducted only a limited number of psychometric tests on the RYSC and future research should continue to test the psychometric properties of the measure (e.g., treatment sensitivity). Third, it should be noted that culture shapes one's social cognitions and future research will need to test whether the findings of the current study generalise to other cultures. Fourth, clinical interviews were not conducted with youth in the community sample, and it is not possible to rule out clinical disorders in this sample. Finally, our samples had an age range from middle childhood to early adolescence. This age range covers an important developmental period during which: (a) as previously noted maladaptive social-evaluative beliefs and the ability to report these beliefs are likely to emerge (around age 7 years), and (b) incidence rates for SAD begin to increase (around age 10 years). Nonetheless, future research will need to examine whether the RYSC is also appropriate for older adolescents (e.g., the term "kids" in items may need to be modified for older adolescents).

The research on SAD in youth has been previously hindered by the lack of a psychometrically validated and developmentally appropriate measure of maladaptive social-evaluative beliefs. The RYSC addresses this gap in the literature. It is hoped that the RYSC will enable future research on the applicability of adult models of SAD to youth, and serve as a useful assessment tool in other research and clinical contexts requiring the measurement of maladaptive social-evaluative beliefs of youth.

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Table 1

Existing psychometrically validated measures of maladaptive social-evaluative beliefs for adults

Measure	Example items	References
Social Thoughts and Beliefs Scale (STABS)	<i>“When I am in a social situation, I appear clumsy to other people”</i>	Turner, Johnson, Beidel, Heiser, & Lydiard, 2003; see also Fergus, Valentiner, Kim, & Stephenson, 2009; Gros & Sarver, 2014
Core Extrusion Schema (CES-R) Scale	<i>“If I said what I really think, people would probably reject me”</i>	Levinson, Rodebaugh, Lim, & Fernandez, 2015; see also Rodebaugh, 2009
Self-Beliefs related to Social Anxiety (SBSA) Scale	<i>“People think I’m inferior”</i>	Wong & Moulds, 2011; Wong, Moulds, & Rapee, 2014; see also Wong & Moulds, 2009
Maladaptive Interpersonal Belief Scale (MIBS)	<i>“If people knew how nervous I get, they would think I was weird”</i>	Boden et al., 2012
Core Beliefs Questionnaire (CBQ)	<i>“I am foolish”</i>	Wong et al., 2017

Table 2

Descriptive statistics for self-report measures administered to the clinical and community samples

Sample	Measure	Available <i>n</i>	Mean	<i>SD</i>	Cronbach's <i>α</i>
Clinical	SCAS				
	Social phobia subscale	138/180	6.79	3.91	.75
	Item “ <i>I worry about things</i> ”	138/180	1.70	0.82	-
Clinical	CATS Social Threat subscale	138/180	8.59	8.04	.91
Community	SASC-R				
	Social Avoidance and Distress–New subscale	300/305	15.87	4.79	.81
	Social Avoidance and Distress–General	300/305	7.73	3.17	.72
Community	CES-DC	300/305	3.73	3.39	.82

Note. In terms of social anxiety measures, the Social phobia subscale score in our clinical sample did not significantly differ with scores from another comparable clinical sample reported in the literature (Social phobia subscale mean = 7.19, *SD* = 4.2; $t(216) = 0.71$, $p = .480$; Whiteside & Brown, 2008). Similarly, the Social Avoidance and Distress–New subscale score and the Social Avoidance and Distress–General subscale score in our community sample did not significantly differ with subscale scores from another comparable community sample reported in the literature (New subscale mean = 16.21, *SD* = 4.70, General subscale mean = 8.03, *SD* = 3.27; all $ts < 1.25$, all $ps > .211$; La Greca & Stone, 1993). SCAS = Spence Children’s Anxiety Scale; CATS = Children’s Automatic Thoughts Scale; SASC-R = Social Anxiety Scale for Children – Revised; CES-DC = Centre for Epidemiological Studies Depression Scale for Children (modified scale composed of 5 items that tap depressed mood).

Table 3

EFA factor loadings and associations with the Social Phobia subscale of the SCAS for the 14 retained RYSC items based on the clinical sample of youth (N = 180)

Item	Factor 1	Factor 2	Factor 3	Correlations with SCAS-SP
Other kids think bad things about me	.87			.30
Other kids think I'm boring	.76			.27
Other kids think I'm silly	.68			.17
If I make a mistake, other kids will laugh at me	.66			.28
People think I'm not as good as other kids	.65			.29
Other kids think I'm odd	.56			.17
Other kids think that I can't do well on tasks	.50			.32
I must not let other kids see when I'm nervous		.77		.17
If I tell people my feelings, they will not like me		.75		.16
If other kids get to know me, they won't like me		.63		.21
If other kids see I'm nervous, they will think I'm strange		.62		.22
I have to look good in front of other children			.94	.23
I have to impress other kids			.59	.20
I need to get other children to like me			.51	.27

Note. Reasons for excluding items included: (a) factor loadings < .50 (“Other kids think I’m shy”, “If I am boring, the other kids won’t like me”, “I’m stupid”), (b) non-significant associations with the SCAS-SP (“Other kids don’t want to play with me”, “Other kids always laugh at me”, “Other children do not like me”, “I look silly to other kids”, “If people see I’m nervous, they will think I’m weird”, “I have to look smart in front of other children”), and (c) both factor loadings < .50 and non-significant associations with the SCAS (“I always get things wrong”, “If other children don’t like me, it is my fault”). SCAS-SP = Social phobia subscale of the Spence Children’s Anxiety Scale. All correlations with the SCAS-SP were significant at the .05 level. Factor 1 labelled as the Negative Evaluation factor. Factor 2 labelled as the Revealing Self factor. Factor 3 labelled as the Positive Impression factor.

Table 4

Reliability of RYSC total scores and subscale scores in the clinical sample and the community sample

Measure	Internal consistency (Cronbach's α)			Test-retest reliability (intraclass correlation coefficient; ICC)	
	Clinical sample ($N = 180$)	Community sample ($N =$ 305)	Community subsample with 7- and 8-year-olds removed ($n = 226$)	Community subsample ($n =$ 32)	Community subsample with 8-year-olds removed ($n = 30$)
RYSC total	.93	.88	.88	.87	.87
RYSC NE	.91	.84	.85	.86	.81
RYSC RS	.82	.70	.72	.64	.72
RYSC PI	.76	.75	.70	.88	.88

Note. RYSC = Report of Youth Social Cognitions; NE = Negative Evaluation subscale; RS = Revealing Self subscale; PI = Positive Impression subscale

Table 5

Zero-order correlations between the RYSC and other measures testing construct validity in the clinical sample and the community sample

Measure	Clinical sample (available $n = 138/180$)		Community sample (available $n = 300/305$)		Community subsample with 7- and 8-year-olds removed (available $n = 221/305$)	
	CATS Social Threat subscale	SCAS item "I worry about things"	SASC-R	CES-DC	SASC-R	CES-DC
RYSC total	.649***	.239**	.566***	.629***	.556***	.612***
RYSC NE	.643***	.209*	.524***	.602***	.513***	.576***
RYSC RS	.540***	.228**	.517***	.581***	.502***	.587***
RYSC PI	.473***	.200*	.360***	.356***	.342***	.320***

Note. RYSC = Report of Youth Social Cognitions; NE = Negative Evaluation subscale; RS = Revealing Self subscale; PI = Positive Impression subscale; CATS = Children's Automatic Thoughts Scale; SCAS = Spence Children's Anxiety Scale; SASC-R = Social Anxiety Scale for Children – Revised (modified scale composed of 6-item Social Avoidance and Distress–New subscale and 4-item Social Avoidance and Distress–General subscale); CES-DC = Centre for Epidemiological Studies Depression Scale for Children (modified scale composed of 5 items that tap depressed mood).

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

Table 6

Fit indices for the two models tested with CFA in the community sample

Model	<i>df</i>	χ^2	CFI	NNFI	RMSEA	SRMR	AIC
Full sample (<i>N</i> = 305)							
Correlated three-factor model	74	147.80**	.950	.939	.057	.049	209.80
One-factor model	77	298.51**	.850	.823	.097	.075	354.51
Subsample (<i>n</i> = 226): 7- and 8-year-olds removed							
Correlated three-factor model	74	147.46**	.936	.921	.066	.059	209.46
One-factor model	77	235.15**	.861	.836	.096	.076	291.15

Note. CFI = comparative fit index; NNFI = non-normed fit index; RMSEA = root mean square error of approximation; SRMR = standard root mean square residual; AIC = Akaike information criterion.

p* < .05, *p* < .01.

Table 7

Comparison of clinical sample youth with SAD as one of their top three diagnoses, clinical sample youth without SAD in their diagnostic profile, and community sample youth with a low probability of SAD

Measure	Range	Clinical sample youth with SAD as one of their top three diagnoses	Clinical sample youth without SAD in their diagnostic profile	Community sample youth with low probability of SAD	<i>F</i>	Follow-up comparisons with Bonferroni correction (1 = Clinical sample youth with SAD; 2 = Clinical sample youth without SAD; 3 = Community sample youth with low probability of SAD)
		<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>		
All available participants						
RYSC total	14-70	25.43 (11.31)	22.07 (8.37)	19.23 (4.63)	17.08***	1 > 2, 1 > 3, 2 > 3
RYSC NE	7-35	12.83 (6.20)	11.14 (4.85)	9.80 (2.91)	12.57***	1 > 2, 1 > 3, 2 = 3
RYSC RS	4-20	6.68 (3.40)	6.04 (2.68)	4.91 (1.39)	15.81***	1 = 2, 1 > 3, 2 > 3
RYSC PI	3-15	5.87 (3.16)	4.80 (1.94)	4.53 (1.77)	9.78***	1 > 2, 1 > 3, 2 = 3
All available participants with 7- and 8-year-olds removed						
RYSC total	14-70	26.13 (10.89)	21.24 (7.85)	19.15 (4.52)	17.18***	1 > 2, 1 > 3, 2 = 3
RYSC NE	7-35	13.26 (5.95)	10.88 (4.36)	9.76 (2.82)	13.46***	1 > 2, 1 > 3, 2 = 3
RYSC RS	4-20	6.89 (3.55)	5.62 (2.43)	4.84 (1.38)	14.68***	1 > 2, 1 > 3, 2 = 3
RYSC PI	3-15	5.89 (2.96)	4.74 (2.10)	4.55 (1.67)	7.56***	1 > 2, 1 > 3, 2 = 3

Note. When all available participants were considered, the samples sizes were: clinical sample youth with SAD as one of their top three diagnoses ($n = 89$), clinical sample youth without SAD in their diagnostic profile ($n = 83$), and community sample youth with a low probability of SAD ($n = 150$). When all available participants were considered but with 7- and 8-year-olds removed, the sample sizes were: clinical sample youth with SAD as one of their top three diagnoses ($n = 54$), clinical sample youth without SAD in their diagnostic profile ($n = 50$), and community sample youth with a low probability of SAD ($n = 121$). RYSC = Report of Youth Social Cognitions; NE = Negative Evaluation subscale; RS = Revealing Self subscale; PI = Positive Impression subscale.

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

Appendix

RYSC

Instructions: Below is a list of thoughts that kids have said pop into their heads. Please read each thought and decide how often, if at all, each thought popped into your head over the PAST WEEK. There are no right or wrong answers. Please be honest. Please do not skip any.

1	2	3	4	5			
Not at all	Sometimes	Fairly Often	Very Often	All the time			
1. Other kids think I'm boring			1	2	3	4	5
2. People think I'm not as good as other kids			1	2	3	4	5
3. I have to look good in front of other children			1	2	3	4	5
4. If other kids see I'm nervous, they will think I'm strange			1	2	3	4	5
5. Other kids think that I can't do well on tasks			1	2	3	4	5
6. Other kids think I'm odd			1	2	3	4	5
7. I need to get other children to like me			1	2	3	4	5
8. If I tell people my feelings, they will not like me			1	2	3	4	5
9. Other kids think bad things about me			1	2	3	4	5
10. Other kids think I'm silly			1	2	3	4	5
11. I have to impress other kids			1	2	3	4	5
12. If other kids get to know me, they won't like me			1	2	3	4	5
13. If I make a mistake, other kids will laugh at me			1	2	3	4	5
14. I must not let other kids see when I'm nervous			1	2	3	4	5