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Validation of an instrument for understanding school absence: the Swedish version of the adapted school refusal assessment scale-revised

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Abstract

Background The School Refusal Assessment Scale-Revised (SRAS-R) is a widely used measure to understand school attendance problems. However, previous evaluations have yielded inconsistent findings on the factor structure.

Methods We prepared a Swedish translation of the original SRAS-R plus the eight alternative items in the adapted versions of the SRAS-R (i.e., the A-SRAS-R). Subsequently, we tested the Swedish A-SRAS-R in a pilot testing, evaluated its factor structure, internal consistency, convergent and discriminant validity, and compared the model fit and internal consistency with the SRAS-R. Participants were students ($n = 399$) aged 12–16 years ($M = 14.7$, $SD = 0.9$) and their parents ($n = 251$).

Results Results supported a four-factor solution of the A-SRAS-R. However, the fourth factor was non-optimal concerning factor loadings and reliability. We found consistent evidence of convergent validity, and inconsistent evidence of discriminant validity.

Conclusion The results provide support for the A-SRAS-R being psychometrically sound, and superior in comparison to the SRAS-R. Notwithstanding the need for further development of the fourth factor, the A-SRAS-R appears to be a valuable instrument for understanding school absence among Swedish young people.

Keywords School attendance problems, Functional assessment, Scale adaptation, Psychometrics, School refusal assessment scale-revised, Adapted school refusal assessment scale-revised

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Introduction

In Sweden, one in four school students were absent 15% or more during the second semester of 2020 [1]. Swedish schools are obliged to assess reasons for absence and offer suitable interventions such as counseling or academic support [2]. Assessment is complicated by the fact that school attendance problems (SAPs) often have multiple underlying causes, associated problems, and manifests in various ways, making it challenging to pinpoint specific reasons for a student's absence [3]. Risk factors for SAPs can be categorized into factors related to the child, peers, parents, family, school, or community [4]. Given this complexity, several tools are often needed in the assessment. It is important that the tools used are psychometrically sound, so that reliable and valid information can be obtained and problems ameliorated [3, 5, 6].

Although (SAPs) have been described in various ways in the literature, Kearney and Silverman [7] argues that these descriptions fail to capture the full range of cases. To address this gap, they proposed a classification system designed to improve both understanding and intervention strategies. A key part of this system is the use of individualized functional analysis to assess SAPs. Drawing on behavioral principles, Kearney and Silverman [7] developed a model that considers the reasons behind school non-attendance suggesting that students avoid school because absence serves a particular function. For instance, a child may stay home to escape anxiety-provoking situations at school or to access more rewarding experiences elsewhere. This model is designed for understanding and assessing SAP among youth by focusing on the motivating factors for non-attendance. According to this functional model of SAP, school non-attendance is maintained through positive and negative reinforcements.

Inspired by Motivation Assessment Scale (MAS) [8], Kearney and Silverman [7, 9] developed the SRAS. The SRAS was designed to identify four hypothesized factors that maintain SAPs: Avoidance of Stimuli That Provoke Negative Affectivity (ANA), Escape from Aversive Social and/or Evaluative Situations (ESE), Pursuit of Attention (PA), and Pursuit of Tangible Reinforcement (PTR). The first two (i.e., ANA and ESE) are functions of negative reinforcement, and the last two (i.e., PA and PTR) functions of positive reinforcement. This scale can be a basis for prescriptive treatment, allowing for the identification of individual motivating factors behind non-attendance. By understanding SAPs in terms of positive and negative reinforcements, the SRAS enables the development of targeted interventions, making the treatment of SAPs more effective when based on an individualized, functional analysis.

School absence is associated with numerous clinical problems, including anxiety, depression, and conduct problems [10, 11], social anxiety, somatic complaints, fatigue, noncompliance, and tantrums [4]. Further, school absence is specified as a symptom in the *Diagnostic and Statistical Manual of Mental Disorders* (e.g., school absence as a symptom of separation anxiety, and truancy as a symptom of conduct disorder) [12]. Accordingly, hypotheses of associations with the four functions of the SRAS were formulated. Kearney and Silverman [9] found support for the connection between negatively reinforced absences to be related to internalizing problems and positively reinforced absences as connected with externalizing problems. The third function, Pursuit of Attention (PA), correlated as expected with externalizing problems, but unexpectedly also with parent-reported internalizing problems. Subsequently, similar findings have been presented by Higa and colleagues [13], Kearney [14], and Haight and colleagues [15]. Theoretically unexpected findings have also been reported, for example with separation anxiety as being associated with the pursuit of tangible reinforcements (PTR). Despite some unexpected and in some cases inconsistent findings, most findings in previous evaluations of the SRAS are still highly consistent. ANA and ESE are mostly associated with internalizing problems, PA with both internalizing and externalizing problems, and PTR with externalizing problems.

The SRAS was revised in 2002 (SRAS-R) [14] to account for (1) the small number of items (i.e., 16), limiting the information available for practitioners; (2) some items being less reliable and the instrument not being stable in different contexts; and (3) modifications to the functional model. In the SRAS-R, 13 items were re-worded, three items were exchanged, and eight items were added to the original 16. Kearney [14] hypothesized that the SRAS-R would yield a four-factor solution, exhibit good test-retest and interrater reliability, and show convergent validity with internalizing and externalizing symptoms across two clinical samples. However, the principal component analyses resulted in a three-factor solution, where the first two factors (ANA and ESE), containing items related to negative reinforcement, were combined into one factor.

Subsequent evaluations of the SRAS-R have produced mixed findings regarding its factor structure in both youth and parent versions (e.g [13, 16, 17, 18]), as well as across different languages into which the instrument has been translated (e.g., German, Turkish). For example, Kearney [19] tested two-factor and three-factor solutions using confirmatory factor analysis (CFA) but found a modified four factor solution to be the strongest. Richards and Hadwin [20] proposed an alternative three-factor solution with several modifications. Notably, the

fourth factor (PTR) was entirely removed, and only 12 of the original 24 items were retained in this model. Ebrahimpzadeh and colleagues [17] and González and colleagues [21] identified the four-factor solution as the one demonstrating the strongest model fit. However, in other evaluations, the four-factor model only had an adequate fit after item removal.

Specific items within the SRAS-R have been repeatedly identified as problematic across various studies. Kearney [19] removed items 18, 20, and 24, Lyon [18] removed items 16, 20, and 24, and Haight and colleagues [15] removed items 19 and 20 from the youth version and items 16, 20, and 24 from the parent version. Further, Richards and Hadwin [20] removed six items from factors 1 to 3, plus the whole PTR scale (i.e., items 4, 8, 12, 16, 20, and 24) in order to find a model with an adequate fit. González and colleagues [22] instead proposed a four-factor model with only 18 of the original 24 items included (i.e., items 16 to 20 and item 24 were excluded). Primarily, items 16, 20, 24 have most consistently been identified as problematic, all three belonging to the PTR scale.

During Heyne and colleagues' [23] work on a Dutch translation of the SRAS-R, they identified the need to account for problematic items, resulting in a new version, the Adapted SRAS-R. Specifically, the eight items added to the original SRAS to form the SRAS-R (i.e., items 17 to 24) were considered to be complex. They were either hypothetical (e.g., "If you had less bad feelings [for example scared, nervous, sad] about school, would it be easier for you to go to school?"), or comparative (e.g., "How often do you stay away from people at school compared to other kids your age?"). For that reason, Heyne and colleagues developed new versions of items 17 to 24. In their psychometric evaluation of the Dutch SRAS-R, the performance of items 1 to 24 (SRAS-R) was compared to the performance of items 1 to 16 (from the original SRAS) combined with items 25 to 32 (their simplified versions of the 8 items added in SRAS-R). They referred to this adapted item set as the A-SRAS-R.

The four-factor structure of this new version, the A-SRAS-R, was supported in Heyne and colleagues' [23] CFA, following removal of items 7 and 28. The researchers also found support for the four-factor structure of the older version, the SRAS-R, following removal of items 18 and 20. They concluded that their hypothesis that the A-SRAS-R would perform better than the SRAS-R, was not supported. However, the ASRAS-R was considered to be an improvement upon the SRAS-R, inasmuch as hypothetical items had been removed, and the wording of the replacement items had a better match with the frequency-related response scale ranging from *Never* to *Always*. Further, internal consistency was higher for all four factors of the A-SRAS-R and three of the four parent

factors, relative to the SRAS-R. Notably, the PTR factor of the A-SRAS-R performed well, unlike in many earlier studies of the SRAS-R.

Despite SAPs having long been recognized as an international concern, and an ongoing need for validated instruments to help practitioners and researchers understand SAPs, there is still a lack of instruments targeting SAPs. The SRAS was one of the first instruments designed to measure the functions of SAPs for the child, and remains widely used, with current translation into more than 10 languages. The A-SRAS-R developed by Heyne and colleagues [23] shows promise, but further evaluation is needed. While research on the psychometric properties of the SRAS-R continues (e.g. [16, 17, 21, 24–26]), there has been no further evaluation of the A-SRAS-R.

The current study

The primary aim of the study was to evaluate the psychometric properties of the Swedish A-SRAS-R. Specifically, we tested its factor structure, internal consistency, and convergent and discriminant validity. Our secondary aim was to compare the Swedish A-SRAS-R with the Swedish SRAS-R with regard to their factor structure and internal consistency. We expected to find: (1) support for a four-factor solution of the A-SRAS-R; (2) adequate internal consistency of the ASRAS-R; (3) evidence of convergent and discriminant validity of the A-SRAS-R, whereby the ANA and ESE factors would be associated with internalizing symptoms and not externalizing symptoms, the PA factor would be associated with anxiety and with externalizing symptoms, and the PTR factor would be associated with externalizing and not internalizing symptoms; and (4) a better model fit and higher internal consistency for the A-SRAS-R relative to the SRAS-R.

Method

Procedures

First, the SRAS-R and the A-SRAS-R were translated into Swedish. Second, these versions were tested in a small-scale pilot testing. Finally, the psychometric properties (i.e., factor structure, internal consistency, convergent and discriminant validity) of the A-SRAS-R were tested in a separate, larger sample.

Translation

We built on a previous translation of the SRAS-R. We translated all four versions (i.e., SRAS-R Youth, A-SRAS-R Youth, SRAS-R Parent, A-SRAS-R Parent) from English into Swedish. The translation process was conducted in accordance with recommendation by van Widenfelt and colleagues [27]. The translation was independently

conducted by three translators (JS, KA, and RP¹), all of whom native Swedish speakers, with English as a second language and experts in the field of school attendance. Minor linguistic differences and nuances in the three versions were discussed (e.g., whether to use the Swedish word *svårt* or *jobbigt* to translate from ‘hard’). After consensus was reached between the three translators, the Swedish versions were translated back into English by JF². The back-translated versions were then sent to the authors of the original English versions; C. A. Kearney [14] (SRAS-R) and D. Heyne [23] (A-SRAS-R) to be compared with the original English versions. Through dialogue, some discrepancies were resolved. For example, the original English version of an item included “have a problem going to school” whereas the back-translation was “hard to go to school” and another original English item included “can’t do things” whereas the nuance in the back-translation was “can’t do many of the things”.

Pilot testing

From November 2020 to January 2021 two boys and six girls, 12–18 years old ($M=14.6$, $SD=2.2$), from urban parts of Sweden and Finland, participated in the pilot testing about the self-report version of the A-SRAS-R and SRAS-R. During the same period eight parents participated in the pilot testing of the parent version. Their children were 8–17 years old ($M=13.0$, $SD=3.2$).

The aim of pilot testing the SRAS-R and A-SRAS-R was to determine whether the instructions and translated questions were clear or needed rephrasing. For this purpose, the two versions of the SRAS-R were mixed into one longer paper-and-pencil version, where the eight new items from the Adapted SRAS-R were added to the SRAS-R, resulting in a total of 32 items to be answered. Participation took place after school hours, at home or at the clinic. First, the participants gave their written informed consent; if the child was under 15 years old parents also gave their consent for their child’s participation. Second, participants completed the questionnaire. Participants were encouraged to read the instructions at the beginning of the instrument. Third, they completed a survey with questions about the combined SRAS-R/A-SRAS-R questionnaire. This survey included questions about the instructions (“Did you read the instructions?”, “Did you understand the instructions?”), each item in the SRAS-R/A-SRAS-R (“Were there any difficult words in the question?”, “Did you understand the question?”, “If not, what was unclear?”), the layout, response time, and level of difficulty of the questions. The participants were finally asked to suggest improvements to the wording if

needed. After the pilot testing, the original authors were consulted (i.e., C. A. Kearney for items 1–24 and D. Heyne for the eight parallel items in the A-SRAS-R).

In the pilot testing, youths completed the combined SRAS-R/A-SRAS-R³ questionnaire in 7 to 21 min ($M=10.4$, $SD=5.4$), while parents took 8 to 30 min ($M=15.1$, $SD=7.4$). Most youths understood the majority of the items; however, for 14 of the 32 items, one or two youths did not fully understand the question. Of these 14 items, four belonged to the SRAS-R (i.e. items 21 to 24) and four were the corresponding parallel versions from the A-SRAS-R. Three youths had difficulty with item number 8: “When you are not in school during the week (Monday to Friday), how often do you talk to or see other people (other than your family)?”. For approximately half of the items (15), one or two parents did not understand the question. Five of these items belonged to the SRAS-R (18, 20, 21, 23, and 24) and five to the A-SRAS-R (26, 28, 29, 30, and 32). Most youths and parents did not think that there were any difficult words in the questionnaire; only in one item did a youth see a word as difficult, and only in two items did one or two parents see a difficult word.

Most of the feedback on the items concerned the response options, particularly the alignment between certain questions and the response scale. For example, item 11 (“How much would you rather be with your family than go to school?”), did not align well with the frequency-based response scale including ‘Never’, ‘Seldom’, ‘Sometimes’, and so on. Four youths (50%) and four parents (50%) commented on this issue. By youths, this was commented on in six of the items belonging to the SRAS-R in comparison to one of the parallel items from the A-SRAS-R. By parents, this was commented on in eight of the items belonging to the SRAS-R in comparison to four of the parallel items from the A-SRAS-R. Others provided feedback on word choices and suggested modifications; for example, using ‘worried’ instead of ‘afraid’, and to vary the examples that appear in several items (i.e., scared, nervous, and sad). Overall, respondents generally accepted the length and layout of the questionnaire.

After the pilot testing, minor revisions were implemented in two items in the youth version and three items of the parent version. Specifically, in item 5, the Swedish word for “depressed” (*deprimerad*) was changed to the milder term “feeling down” (*nedstämd*). In item 8, “school day” was changed to “school hours”. Throughout the questionnaire, gender-specific pronouns (‘him’ or ‘her’) were replaced with the gender-neutral form ‘hen’. These minor adjustments aimed to enhance comprehensibility, with no major changes introduced.

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³ SRAS-R plus the eight parallel items in the A-SRAS-R.

Psychometric evaluation

A self-selection method was employed to recruit schools interested in participating in the study. Schools were invited to join through a webinar, where they received detailed information about the study. Following this, interested schools were contacted to arrange dates for data collection. School had the option to participate in one of three ways: (1) involving the entire school, (2) specific parts of the school (such as one class), or (3) focusing solely on at-risk youth or SAPs, identified by the student health team. Eligible participants were students aged 12 to 16, along with their parents.

A web survey was designed containing demographic questions and measures, with the instrument order randomized for each participant. For this purpose, the two versions of the SRAS-R were mixed into one longer version, where the eight new items from the Adapted SRAS-R were added to the SRAS-R, resulting in a total of 32 items to be answered. Participants were eligible to respond to the web survey in one of two ways: (1) the school setting and (2) the student health team. In the former, students anonymously completed the web survey in their classroom during school hours, using either school computers or their personal cell phone. In the latter, students completed the web survey individually in the office of the student health team, not anonymously. They were informed in advance that their responses were not anonymous and would be accessible to the student health

team as part of their assessment of the students' SAP. Parents completed the web survey through an optional platform (e.g., phone or computer). Parents of students in the school setting remained anonymous, while those responding through the student health team were not.

Participants

The initial sample comprised 414 students. Three of these were excluded due to a lack of written consent and six were excluded because inclusion criteria were not met (i.e., the student was younger than 12 or older than 16). A further six students' responses were excluded from the main analysis due to missing information about their age. Table 1 presents information about the final sample of 399 students. It comprised 211 males, 180 females, and 8 students who identified as another gender. The students ranged in age from 12 to 16 ($M = 14.7$, $SD = 0.9$). Students came from 13 different schools. Nine schools recruited one or more students, three schools involved all students in the school (one was a resource school, serving children with special education needs), and one school involved one or more classes. In total, 80% of students were recruited from a regular school setting, 16% from a resource school, and 5% via the student health team. The study included 251 parents to students aged 12 to 16, including 169 mothers, 78 fathers, and 4 with another relation to the child (e.g., foster care parent). Their ages ranged between 33 and 70 ($M = 46.9$, $SD = 5.5$). The majority (67%) had a university-level education, 6% had higher vocational education, 25% had a high school education, and 2% had a compulsory school education. Only one parent or guardian per student was invited to participate.

Table 1 Participants characteristics

		Regu- lar school setting	Re- source school	Stu- dent health team	Total
Youth	<i>N</i>	318	63	18	399
	Gender (Female/Male/Other)	55/43/2	40/60/0	56/39/6	53/45/2
	Age– <i>M</i> (<i>SD</i>)	14.7 (0.9)	14.4 (1.0)	14.2 (1.0)	14.7 (0.9)
	Age– Min-max	13–16	12–16	12–16	12–16
	School absence ^a <i>M</i> (<i>SD</i>)	2.3 (3.9)	4.0 (4.5)	9.0 (7.7)	2.9 (4.5)
	SAP ^b <i>N</i> (%)	100 (31)	24 (38)	17 (94)	141 (35)
Parent	<i>N</i>	160	75	16	251
	Educational Level <i>N</i> (%)				
	Compulsory School Education	1 (0.6)	2 (2.7)	1 (6.3)	4 (1.6)
	High School Education	44 (27.5)	12 (16.0)	6 (37.5)	62 (24.7)
	Higher Vocational Education	7 (4.4)	6 (8.0)	2 (12.5)	15 (6.0)
	University-level Education	108 (67.5)	55 (73.3)	7 (43.8)	170 (67.7)

Note. SAP = School Attendance Problems

^a = Number of days absent during the last 20 school days

^b = Number of students with SAP according to the definition by Kearney [5]

Measures

School refusal assessment scale– revised and the adapted school refusal assessment scale-revised

The School Refusal Assessment Scale Revised (SRAS-R) [14] (Table 2) consists of 24 items designed to assess four functions, with six items related to each function: (1) Avoidance of Stimuli That Provoke Negative Affectivity (ANA), (2) Escape from Aversive Social and/or Evaluative Situations (ESE), (3) Pursuit of Attention (PA), and (4) Pursuit of Tangible Reinforcement (PTR). Items are answered on a 7-point Likert scale ranging from 0 (*never*) to 6 (*always*). Function scale scores are determined by adding up the item scores and dividing the total by six. Higher scores reflect a greater level of function. In the Adapted SRAS-R (A-SRAS-R) [23], the last eight items of the SRAS-R were re-worded to provide greater clarity. Item 17 was replaced with item 25, item 21 with item 29, and so on (Table 2). Youth and parents responded to the 24 items of the SRAS-R along with the 8 new items from the A-SRAS-R, resulting in a total of 32 items.

Table 2 A-SRAS-R and SRAS-R youth versions

Factor	No	Item
ANA	1	How often do you have bad feelings about going to school because you are afraid of something related to school (for example, tests, school bus, teacher, fire alarm)?
	5	How often do you stay away from school because you will feel sad or depressed if you go?
	9	How often do you feel worse at school (for example, scared, nervous, or sad) compared to how you feel at home with friends?
	13	How often do you have bad feelings about school (for example, scared, nervous, or sad) when you think about school on Saturday and Sunday?
	17	If you had less bad feelings (for example, scared, nervous, sad) about school, would it be easier for you to go to school?
	21	How much more do you have bad feelings about school (for example, scared, nervous, or sad) compared to other kids your age?
	25	How often do you have a problem going to school because you have bad feelings about school (e.g., scared, nervous, sad)?
	29	Some boys/girls have bad feelings about school (e.g., scared, nervous, sad). How often do you have bad feelings about school, compared to others your age?
	ESE	2
6		How often do you stay away from school because you feel embarrassed in front of other people at school?
10		How often do you stay away from school because you do not have many friends there?
14		How often do you stay away from certain places in school (e.g., hallways, places where certain groups of people are) where you would have to talk to someone?
18		If it were easier for you to make new friends, would it be easier for you to go to school?
22		How often do you stay away from people at school compared to other kids your age?
26		How often do you have a problem going to school because you find it difficult to make friends?
30		Some boys/girls stay away from people at school. How often do you do that, compared to others your age?
PA		3
	7	How often do you think about your parents or family when in school?
	11	How much would you rather be with your family than go to school?
	15	How much would you rather be taught by your parents at home than by your teacher at school?
	19	Would it be easier for you to go to school if your parents went with you?
	23	Would you like to be home with your parents more than other kids your age would?
	27	How often do you have a problem going to school because you're not with your parents when you're at school?
	31	Some boys/girls like to stay at home with their parents rather than go to school. How often would you like to stay at home with your parents, compared to others your age?
	PTR	4
8		When you are not in school during the week (Monday to Friday), how often do you talk to or see other people (other than your family)?
12		When you are not in school during the week (Monday to Friday), how much do you enjoy doing different things (for example, being with friends, going places)?
16		How often do you refuse to go to school because you want to have fun outside of school?
20		Would it be easier for you to go to school if you could do more things you like to do after school hours (for example, being with friends)?
24		Would you rather be doing fun things outside of school more than most kids your age?
28		How often do you have a problem going to school because, after school hours, you don't get to do many of the things you like to do (e.g., being with friends)?
32		Some boys/girls would rather do fun things outside of school during school-time. How often do you want to do that, compared to others your age?

Inventory of school attendance problems

Youth rated the Inventory of School Attendance Problems (ISAP) [28]. ISAP is an instrument consisting of 48 items measuring 13 factors over the past 12 weeks: Depression, Social Anxiety, Separation Anxiety, Performance Anxiety, Agoraphobia/Panic, Somatic Complaints, School Aversion/Attractive Alternatives, Aggression, Problems with Peers, Problems with Teachers, Dislike of the Specific School, Problems Within the Family, and Problems with Parents. Each item is answered in two ways; the first response relates to the symptoms

represented in the item (i.e., ‘how much does this apply to me?’) and the second response relates to the function of the symptom (i.e., ‘that’s why I miss school or attending school is hard for me’). Only the first response way (i.e., the symptom scales) was used in the current study. ISAP items are scored on a 4-point Likert-type scale from 0 (*not true at all/never*) to 3 (*very much true/very often*). Examples of items are: “Before or at school/school time, I am longing for my parents and want to be with them”, and “Before or at school/school time, I quickly become

aggressive". Cronbach's alphas for the 13 factors varied between 0.65 and 0.90 for the symptom scales.

Strengths and difficulties questionnaire

Youth and parents responded to the Strengths and Difficulties Questionnaire (SDQ) [29], a screening questionnaire measuring positive and negative attributes in children and adolescents. It comprises five factors: Emotional Symptoms, Conduct Problems, Hyperactivity-Inattention, Peer Problems, and Prosocial Behavior. Items (e.g., "Considerate of other people's feelings", "Often unhappy, depressed or tearful") are responded to using a 3-point Likert-type scale: 'not true', 'somewhat true', 'certainly true', yielding factor scores from 0 to 10 [30, 31]. Higher scores correspond to more symptoms. Higher scores on prosocial behavior correspond to more positive attributes. Five items are reversed scored. In the current sample, Cronbach's alphas for the five factors were 0.78, 0.58, 0.74, 0.58, and 0.78 for youth reports, and 0.76, 0.63, 0.86, 0.72, and 0.78 for parent reports.

Data analyses

We conducted data analyses using R, utilizing the following packages: lavaan 06–15 [32] for structural equation modeling, psych version 2.3.3 [33] for psychometric analyses, and tidyverse version 2.0.0 [34] for data manipulation and visualization. Prior to analysis, we assessed data for both univariate and multivariate normality. In studies of the SRAS, procedures for addressing unanswered items included coding them as "0" [9] and excluding them when computing the functional condition [7]. In the current study, participants with more than 30% unanswered items were excluded from the analysis, and missing data were imputed using the mice package version 3.16.0 [35].

The factor structure of the A-SRAS-R and SRAS-R (see models in Figs. 1, 2, 3 and 4) was assessed using CFA with estimation based on raw data and the Weighted Least Squares Mean and Variance adjusted (WLSMV) method, reporting robust scaled values. This estimation method, suitable for skewed ordinal-level data, has been employed in prior evaluations of the SRAS-R by González and colleagues [22] and Orm and colleagues [25].

We assessed model fit using five goodness-of-fit indices: Chi-square goodness-of-fit (χ^2) test, Root-Mean-Square Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR), Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI). We applied a norm-based approach to choosing cut-offs [36], informed by previous CFAs of the SRAS-R [19, 22, 23]. Hence, acceptable model fit was indicated by a non-significant chi-square, RMSEA < 0.08, SRMR < 0.08, CFI > 0.90, and TLI > 0.90. Factor loadings below 0.30 were described as low, and items with loadings < 0.30 were removed during

model trimming. We assessed internal consistency using Cronbach's alpha [37] and McDonald's omega hierarchical [38]. Cronbach's alpha values above 0.70 indicated adequate internal consistency. Convergent and discriminant validity were tested using Spearman's correlation. Correlations were considered small (0.10–0.29), medium (0.30–0.49) or large (> 0.50) based on Cohen's [39] guidelines.

Results

Missing values and item level analysis of normal distribution

Participants with more than 30% missing values were excluded from further analyses. Specifically, 32 youths were excluded from the CFA of the A-SRAS-R and SRAS-R; 54 parents were excluded from the CFA of the A-SRAS-R and 55 parents were excluded from the CFA of the SRAS-R. Following exclusion, the prevalence of missing values was low (0.00–0.01% for youth, 0.00–0.02% for parents). Data was non-normally distributed and treated as being on an ordinal level, with standardized skewness values ranging from 0.51 to 3.22. Descriptive statistics for the factors were comparable between the A-SRAS-R and SRAS-R (see Table 3). The three first factors (ANA, ESE, and PA) exhibited high positive skewness, while the fourth factor showed a more normal distribution (Skewness < 0.90). Moreover, the PTR factor displayed greater dispersion compared to the other factors in both the youth and parent versions of the A-SRAS-R. The trimmed version of the PTR factor showed a distribution more comparable to the other factors; it was more positively skewed, and there was less dispersion.

Factor analysis

Separate factor analyses for the four versions were conducted: A-SRAS-R youth, SRAS-R youth, A-SRAS-R parent, and SRAS-R parent. Inter item correlations ranged from –0.11 to 0.83, with the weakest correlations observed for items 4, 8, 12, and 24. Overall, factor loadings were substantial, however, some items in the PTR factor exhibited loadings below 0.30.

Youth versions of the SRAS-R and A-SRAS-R

For the two youth versions, most factor loadings were large, although some were below 0.30: three factor loadings in the A-SRAS-R (Item 4: 0.19; Item 8: 0.08; Item 12: 0.22), and one factor loading in the SRAS-R (Item 8: 0.19). In the A-SRAS-R youth version, four out of five fit indices indicated an adequate fit (Table 4): χ^2 [246] = 680.261; p < .001; RMSEA = 0.060; 90% CI [0.054, 0.065]; SRMR = 0.079; CFI = 0.945; TLI = 0.939. Conversely, for the SRAS-R youth version, the original four-factor model of 24 items was partially supported, with three of five fit indices indicating adequate fit: χ^2

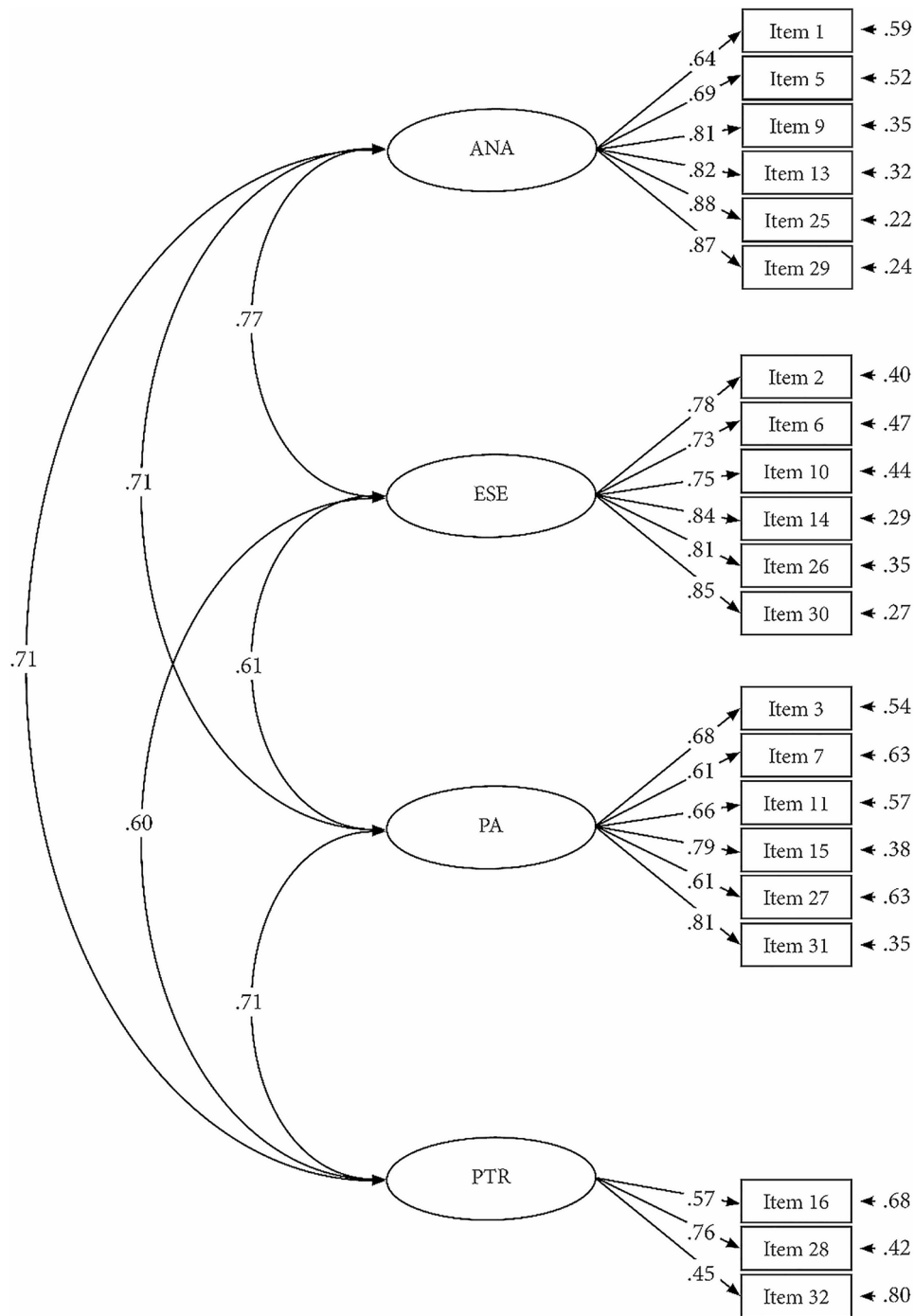


Fig. 1 Factor loadings and error terms for the A-SRAS-R youth version. Note. ANA=avoidance of stimuli that provokes negative affectivity; ESE=escape from aversive social and/or evaluative situation; PA=pursuit of attention; PTR=pursuit of tangible reinforcement. All factor loading were statistically significantly different from 0 ($p < .05$). Factor correlations were statistically significant ($p < .05$)

[246] = 762.268; $p < .001$; RMSEA = 0.071; 90% CI [0.066, 0.077]; SRMR = 0.088; CFI = 0.918; TLI = 0.908. Notably, all five fit indices demonstrated better performance for the A-SRAS-R youth version compared to the SRAS-R youth version.

Despite adequate initial model fit, we explored alternative models (Table 4). For the A-SRAS-R, removing three items with low factor loadings, items 4, 8, and 12, led to improved model fit and eliminated low loadings (Fig. 1). For SRAS-R, item 8 initially showed a low loading and was removed. However, this led to item 4 showing a low

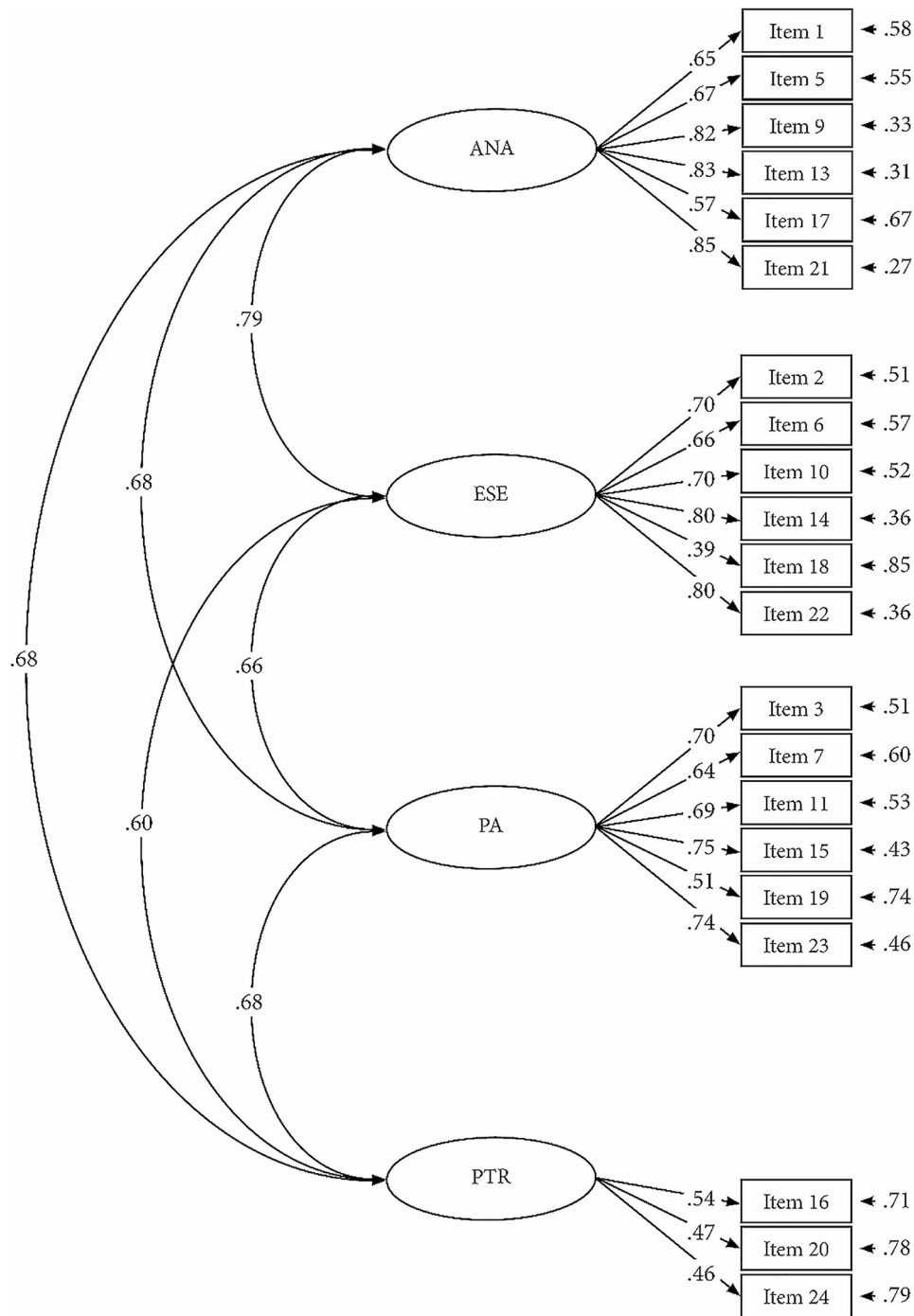


Fig. 2 Factor loadings and error terms for the SRAS-R youth version. Note. ANA=avoidance of stimuli that provokes negative affectivity; ESE=escape from aversive social and/or evaluative situation; PA=pursuit of attention; PTR=pursuit of tangible reinforcement. All factor loading were statistically significantly different from 0 ($p < .05$). Factor correlations were statistically significant ($p < .05$)

loading (0.27), prompting its removed. In the resulting model, item 12 also showed a low loading (0.28) and was subsequently removed (Fig. 2). These adjustments improved model fit overall, with the A-SRAS-R still performing better than the SRAS-R.

Parent versions of the SRAS-R and A-SRAS-R

In the two parent versions, most factor loadings were large. However, some loadings were small or negative. Specifically, in the A-SRAS-R parent version, items 4, 8, and 12 exhibited factor loadings below 0.30 (0.09, -0.06, and 0.12, respectively, see Fig. 3). Similarly, these same

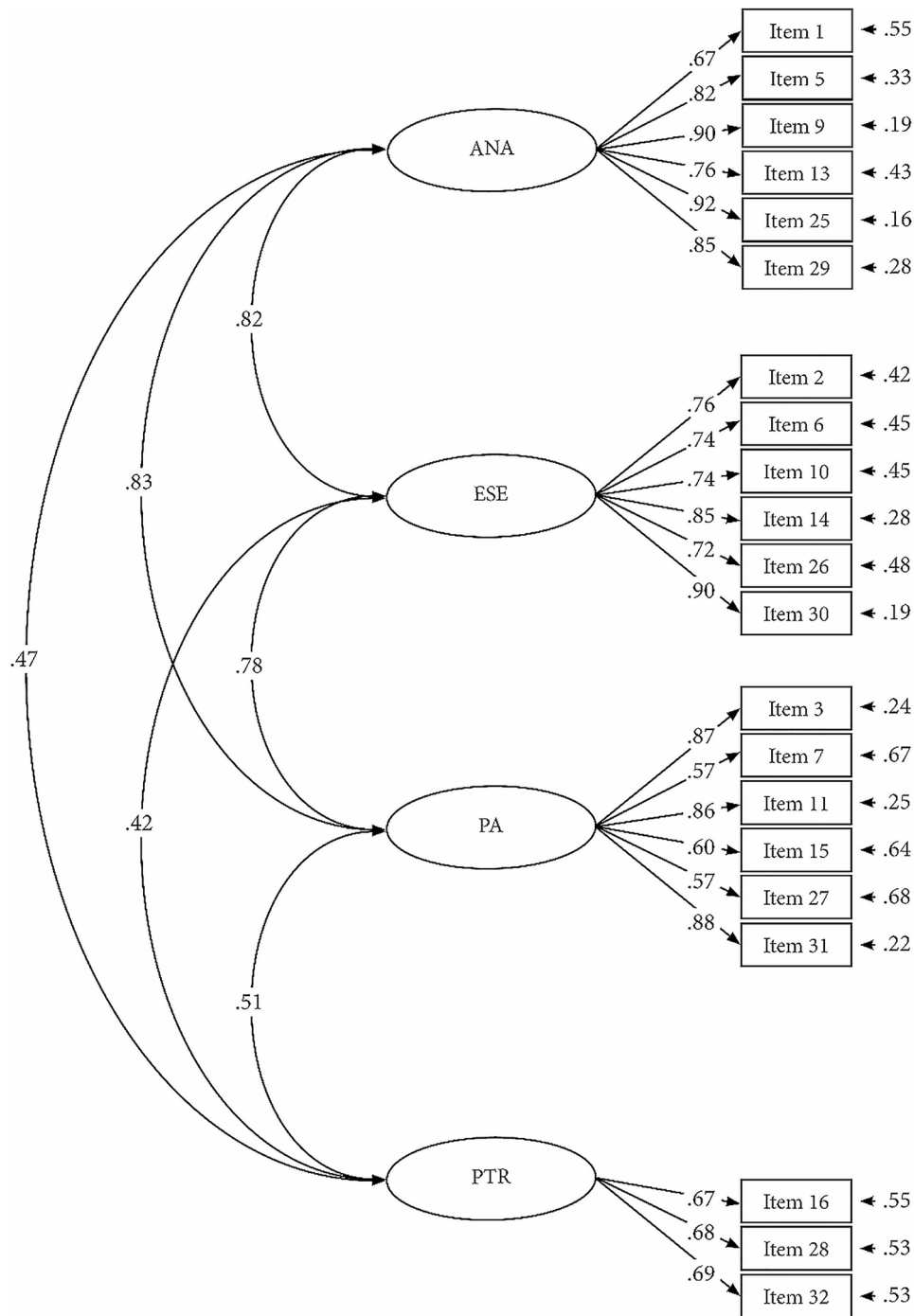


Fig. 3 Factor loadings and error terms for the A-SRAS-R parent version. Note. ANA=avoidance of stimuli that provoke negative affectivity; ESE=escape from aversive social and/or evaluative situation; PA=pursuit of attention; PTR=pursuit of tangible reinforcement. Factor loadings were statistically significantly different from 0 ($p < .05$). Factor correlations were statistically significant ($p < .05$)

three items (4, 8, and 12) in the SRAS-R parent version also had loadings below 0.30: 0.17, 0.01, and 0.21, respectively (see Fig. 4). In the CFA of the A-SRAS-R parent version, four out of five fit indices indicated adequate fit: $\chi^2 [246] = 408.836$; $p < .001$; RMSEA = 0.057; 90% CI [0.047, 0.066]; SRMR = 0.079; CFI = 1.000; TLI = 1.004.

Conversely, in the CFA of the SRAS-R parent version, three of five fit indices suggested adequate fit: $\chi^2 [246] = 447.467$; $p < .001$; RMSEA = 0.068; 90% CI [0.058, 0.078]; SRMR = 0.087; CFI = 0.946; TLI = 0.939. Notably, all five fit indices demonstrated better performance in the

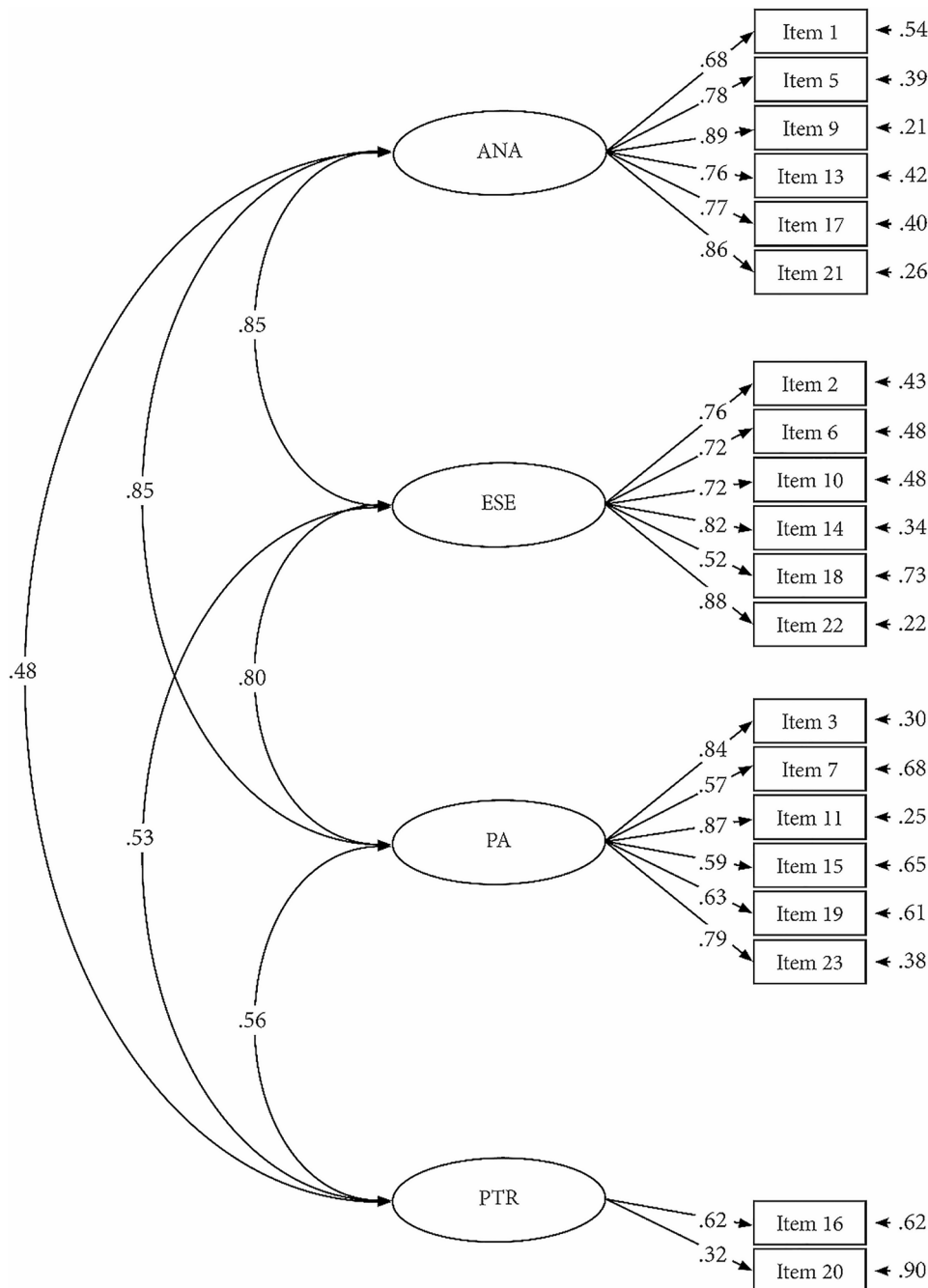


Fig. 4 Factor loadings and error terms for the SRAS-R parent version. Note. ANA=avoidance of stimuli that provoke negative affectivity; ESE=escape from aversive social and/or evaluative situation; PA=pursuit of attention; PTR=pursuit of tangible reinforcement. Factor loadings were statistically significantly different from 0 ($p < .05$). Factor correlations were statistically significant ($p < .05$)

A-SRAS-R parent version compared to the SRAS-R parent version.

We then trimmed both parent versions by removing items with low factor loadings (< 0.30), resulting in the removal of items 4, 8, and 12 (see Figs. 3 and 4). Following these removals, item 24 showed a low loading (0.24) and was also excluded from the model. These adjustments led

to an improved model fit, with fit indices indicating a better fit for the A-SRAS-R compared to the SRAS-R.

Internal consistency

Cronbach's alpha coefficients for the four factors in the original A-SRAS-R model, for both youth and parent versions, exceeded 0.70 (Table 3), except for the youth-rated PTR where alpha was 0.69. Omega hierarchical

Table 3 Descriptives and internal consistency for the factors in A-SRAS-R and SRAS-R

	Youth					Parent							
	M	[CI]	(SD)	Md	α	ω_h	diff $M_y - M_p$	M	[CI]	(SD)	Md	α	ω_h
A-SRAS-R													
ANA	1.24	[1.10–1.38]	(1.33)	0.83	0.91	0.84	0.12	1.36	[1.14–1.58]	(1.49)	0.83	0.92	0.88
ESE	0.60	[0.50–0.70]	(1.01)	0.17	0.92	0.84	0.23	0.83	[0.67–0.99]	(1.13)	0.50	0.91	0.80
PA	1.17	[1.05–1.29]	(1.10)	0.83	0.84	0.73	0.16	1.01	[0.85–1.17]	(1.14)	0.67	0.87	0.85
PTR	1.03	[0.91–1.15]	(1.09)	0.67	0.61	0.58	0.32	0.71	[0.57–0.85]	(1.00)	0.33	0.74	0.03
SRAS-R													
ANA	1.38	[1.25–1.52]	(1.32)	1.00	0.87	0.82	0.12	1.50	[1.28–1.72]	(1.53)	1.00	0.91	0.87
ESE	0.82	[0.72–0.92]	(1.01)	0.50	0.86	0.80	0.18	1.00	[0.84–1.16]	(1.19)	0.67	0.88	0.81
PA	1.21	[1.09–1.33]	(1.11)	0.83	0.83	0.74	0.10	1.11	[0.93–1.29]	(1.19)	0.67	0.86	0.84
PTR	1.60	[1.48–1.72]	(1.22)	1.33	0.50	0.01	0.82	0.78	[0.62–0.94]	(1.05)	0.25	0.33	0.87

Note. CI = Confidence interval, Md = Median, α = Cronbach's alpha, ω_h = McDonald's omega hierarchical, diff $M_y - M_p$ = difference in mean between youth and parent rating, ASRAS-R = Adapted School Refusal Assessment Scale - Revised, SRAS-R = School Refusal Assessment Scale - Revised, ANA = avoidance of stimuli that provoke negative affectivity, ESE = escape from aversive social and/or evaluative situation, PA = pursuit of attention, PTR = pursuit of tangible reinforcement

were consistently lower than the Cronbach's alpha, for all factors and all versions of the instrument. Omega hierarchical values for the first three factors in both youth and parent versions of the A-SRAS-R were also above 0.70. However, the omega hierarchical values were notably lower for the PTR factor, with values of 0.38 for the youth version and 0.46 for the parent version.

In the final versions of the A-SRAS-R, item removal led to changes in both alpha and omega values. For the A-SRAS-R youth version, alpha decreased from 0.69 to 0.61, while omega increased from 0.38 to 0.58. In contrast, for the A-SRAS-R parent version, alpha increased from 0.72 to 0.74, while omega decreased from 0.46 to 0.03.

Convergent and discriminant validity of the A-SRAS-R

As expected, youth-rated ANA and ESE correlated with ISAP variables measuring internalizing symptoms, including Depression, Social Anxiety, Separation Anxiety and Agoraphobia/Panic (Table 5). Both youth- and parent-rated ANA and ESE were highly associated with the SDQ factor of Emotional Symptoms. Unexpectedly, ANA and ESE ratings from both youth and parents also showed associations with externalizing symptoms, including medium correlations with Aggression and Conduct Problems.

Large correlations were observed between PA and Separation Anxiety. Youth rated PA was associated with internalizing symptoms, including medium correlations with Depression, Social Anxiety, and Emotional symptoms, and externalizing symptoms, including medium correlation with Aggression and small correlation with Conduct problems. As expected, parent rated PA were associated with internalizing and externalizing symptoms. The association between parent rated PA and Emotional symptoms was large.

Youth- and parent-rated PTR scores were associated with Conduct Problems and Hyperactivity-Inattention. Additionally, youth-rated PTR was moderately correlated with School Aversion and Aggression. Unexpectedly, small to medium statistically significant correlations were also observed between PTR and measures of internalizing problems. Moreover, while youth-rated PTR was associated with Aggression on the ISAP, even stronger associations were found between youth-rated ANA and Aggression. A similar pattern emerged when comparing correlations between both youth and parent versions of A-SRAS-R factors with the SDQ factor Conduct Problems: all correlations were statistically significant, with ANA and ESE showing correlations with Conduct Problems that were as strong as, or stronger than, those of PA and PTR.

Table 4 Goodness-of-fit indices from factor analyzes, including trimmed version with items removed

	χ^2	df	CFI	TLI	RMSEA	90% CI RMSEA	SRMR
A-SRAS-R Youth version	680.261***	246	0.945	0.939	0.060	[0.054, 0.065]	0.079
Trimmed version (- Item 4, 8, & 12)	354.836***	183	0.984	0.981	0.037	[0.031, 0.042]	0.068
SRAS-R Youth version	762.268***	246	0.918	0.908	0.071	[0.066, 0.077]	0.088
Trimmed version (- Item 8)	642.923***	224	0.938	0.930	0.064	[0.058, 0.070]	0.082
Trimmed version (- Item 4, 8, & 12)	536.087***	183	0.953	0.946	0.060	[0.054, 0.066]	0.080
A-SRAS-R Parent version	408.836***	246	1.000	1.004	0.057	[0.047, 0.066]	0.079
Trimmed version (- Item 4, 8, & 12)	213.557***	183	0.995	0.995	0.022	[0.000, 0.034]	0.057
SRAS-R Parent version	447.467***	246	0.946	0.939	0.068	[0.058, 0.078]	0.087
Trimmed version (- Item 4, 8, & 12)	289.388***	183	0.980	0.977	0.047	[0.036, 0.057]	0.067
Trimmed version (- Item 4, 8, 12, & 24)	269.366***	164	0.983	0.980	0.046	[0.036, 0.055]	0.066

Note. *df*=degrees of freedom, CFI=Comparative Fit Index, TLI=Tucker Lewis Index, RMSEA=Root-Mean-Square Error of Approximation, CI=Confidence Interval, SRMR=Standardized Root Mean Square Residuals, A-SRAS-R=Adapted School Refusal Assessment Scale Revised, SRAS-R=School Refusal Assessment Scale Revised
p*<.05. *p*<.01. ****p*<.001

Table 5 Correlations of youth and parent A-SRAS-R with constructs in ISAP and SDQ

	Youth				Parent			
	ANA	ESE	PA	PTR	ANA	ESE	PA	PTR
ISAP								
Depression	0.74**	0.58**	0.45**	0.38**				
Social anxiety	0.61**	0.59**	0.42**	0.28**				
Separation anxiety	0.41**	0.38**	0.59**	0.31**				
Performance anxiety	0.57**	0.42**	0.36**	0.32**				
Agoraphobia/panic	0.56**	0.53**	0.37**	0.28**				
Somatic complaints	0.53**	0.46**	0.43**	0.33**				
School aversion	0.48**	0.37**	0.36**	0.48**				
Aggression	0.43**	0.35**	0.30**	0.35**				
Problems with peers	0.51**	0.60**	0.38**	0.28**				
Problems with teachers	0.41**	0.40**	0.34**	0.28**				
Dislike of specific school	0.36**	0.38**	0.34**	0.33**				
Problems within the family	0.43**	0.39**	0.31**	0.27**				
Problems with parents	0.35**	0.36**	0.28**	0.28**				
SDQ								
Emotional symptoms	0.73**	0.58**	0.39**	0.34**	0.65**	0.64**	0.58**	0.33**
Conduct problems	0.30**	0.42**	0.27**	0.32**	0.42**	0.42**	0.27**	0.45**
Hyperactivity-Inattention	0.28**	0.19**	0.25**	0.29**	0.42**	0.40**	0.39**	0.51**
Peer problems	0.33**	0.47**	0.30**	0.23**	0.47**	0.62**	0.42**	0.25**

Note. ISAP=Inventory of School Attendance Problems, SDQ=Strengths and Difficulties Questionnaire, ANA=avoidance of stimuli that provoke negative affectivity, ESE=escape from aversive social and/or evaluative situation, PA=pursuit of attention, PTR=pursuit of tangible reinforcement

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

Discussion

After translation and pilot testing of the Swedish A-SRAS-R, we evaluated its factor structure, internal consistency, and convergent and discriminant validity, and compared its factor structure and internal consistency with that of the SRAS-R. Results for both youth and parent versions of the A-SRAS-R indicated that factor loadings were generally large, and the 4-factor solution was supported. Removing items with weak factor loadings from the PTR factor improved model fit. While alpha and omega hierarchical values were adequate overall, the PTR factor showed lower alpha and omega hierarchical values. We found consistent evidence of

convergent validity when comparing the A-SRAS-R to measures of internalizing and externalizing symptoms. However, evidence of discriminant validity was inconsistent, including unexpectedly strong correlations between ANA and ESE with externalizing symptoms, and between PTR and internalizing symptoms.

Our pilot testing of the Swedish A-SRAS-R indicated that respondents had difficulties with the response scale. Other limitations of the SRAS-R have been identified in previous studies, including complex or ambiguous item wordings [23] and the use of conditional formulations in items [18] or hypothetical formulations [15]. However, in our pilot testing of the Swedish translation of the

A-SRAS-R, feedback from youth and parents focused less on specific questions and more on the response format of the scale. Respondents did not align well with the framing of items, not only in the original SRAS (e.g., items 11 and 12) and to items in the SRAS-R (e.g., items 17 and 23), but also in reworded items from the A-SRAS-R (e.g., item 29). Consequently, acceptance and comprehensibility of the questionnaire could be compromised.

Notably, the A-SRAS-R exhibited stronger psychometric properties compared to the SRAS-R, with the youth and parent versions of the A-SRAS-R demonstrating good fit, whereas the SRAS-R only partially achieved good fit. Among the 16 measures of internal consistency (i.e., alpha and omega hierarchical), 11 were higher for the A-SRAS-R and five were higher for the SRAS-R. After item removal, these results prevailed. These findings suggest that the A-SRAS-R represents an improvement over the original SRAS-R in terms of psychometric strengths and fit.

In comparing our results to the previous study of the A-SRAS-R [23], we found support for the four-factor solution of the A-SRAS-R. In the final models, items with low factor loading were removed, resulting in an improved model fit. In contrast, Heyne and colleagues [23] reported that the A-SRAS-R performed better than the SRAS-R (both youth and parent versions) only after removing specific items. Their study revealed that neither version of the original 24-item model achieved adequate fit initially. They removed items 7 and 28 from the A-SRAS-R and items 18 and 20 from the SRAS-R to achieve model fit. In the current study, these items did not pose issues as their factor loadings were adequate. Instead, other items were removed (i.e., items 4, 8, and 12).

Despite achieving an adequate overall fit for the model, we identified psychometric issues related to the PTR factor. While most factor loadings in the A-SRAS-R were large, several were notably small, or even negative, all of which were associated with the PTR factor. Specifically, factor loadings for item 4 (“When you are not in school during the week [Monday to Friday], how often do you leave the house and do something fun?”) were 0.19 in the youth version and 0.09 in the parent version. Factor loadings for item 8 (“When you are not in school during the week [Monday to Friday], how often do you talk to or see other people [other than your family]?”) were 0.08 in the youth version and -0.06 in the parent version. Additionally, factor loadings for item 12 (“When you are not in school during the week [Monday to Friday], how much do you enjoy doing different things [for example, being with friends, going places]?”) were 0.22 in the youth version and 0.12 in the parent version. Furthermore, alpha and omega values for the PTR factor were lower compared to other factors, indicating that this factor may not

be well-defined or may encompass multiple underlying dimensions. Removing items 4, 8, and 12, along with item 24 in the SRAS-R parent version, improved model fit.

Previous studies consistently highlight the fourth factor, PTR, as problematic. Heyne and colleagues (2017) attempted to improve the SRAS-R by replacing the last eight items, representing two items from each factor. Although these changes enhanced the model fit, the questionnaire still contained non-optimal items. Specifically, the eight items added in the SRAS-R to the original 16 from the SRAS were the items replaced. Seven of these additional items have repeatedly been subjected to model trimming due to low factor loadings or cross-loadings [15, 18, 19, 20], confirming their problematic nature. Furthermore, among the eleven items previously removed from the SRAS-R, five belong to the PTR factor, with five out of six PTR items having been removed at least once. Notably, items 16, 20, and 24 have consistently posed challenges and were removed across multiple studies. Therefore, further development of the PTR factor is necessary to address the issues identified in prior studies and in the current study.

Our findings supported the hypothesis of convergent validity but not discriminant validity, with some unexpected associations. Foremost, ANA and ESE showed strong associations with measures of internalizing symptoms. PA was associated with separation anxiety, with higher correlation compared to other SRAS factors. Both PA and PTR were associated with externalizing symptoms. Interestingly, our analyses revealed additional correlations beyond those previously identified, with most being statistically significant and small or medium in magnitude. Contrary to our hypothesis, ANA and ESE showed strong associations with externalizing symptoms such as aggression and conduct problems. However, this finding is consistent with previous SRAS-R studies. Heyne and colleagues [23] suggested that these associations might be related to children who experience school refusal exhibiting aggressive behavior, such as morning temper tantrums, due to fear or emotional distress related to school attendance.

Additionally, although we observed correlations between PTR and measures of externalizing symptoms, the correlations between other A-SRAS-R factors and externalizing symptoms were as strong or stronger. For example, the correlation between youth-reported conduct problems and PTR was 0.32, compared to 0.27 for PA, 0.42 for ESE, and 0.30 for ANA. This pattern may be explained by ANA and ESE in our sample being associated with a higher overall level of psychiatric symptoms, including both internalizing and externalizing symptoms, whereas PA and PTR factors are associated with a generally lower level of symptoms. Irritability, for example, is a common symptom across internalizing psychiatric

diagnoses [12]. Another explanation of the strong associations could be that internalizing and externalizing symptoms are co-occurring as a joint developmental trajectory [40, 41].

Strengths, limitations, and future directions

Our study contributes to the SRAS literature by incorporating a recent development— the A-SRAS-R— and by conducting a pilot testing to explore respondents' experiences with the questionnaire. We expanded the psychometric validation by evaluating newly translated Swedish versions in a small pilot testing as part of the validation process to assess the questionnaire's understandability. Additionally, we collected data not only in classroom settings, but also through the student health team, enhancing opportunities for students with higher levels of school absence to participate.

Two limitations of the study are noteworthy. First, while we included students with SAPs by recruiting via the student health team, this group was relatively small. Second, survey response bias could have occurred due to the length of the web survey. Future research could explore additional aspects of reliability and validity, including test-retest reliability and inter-rater reliability. It would also be valuable to further validate the Swedish A-SRAS-R in clinical samples with SAPs.

Implications

The A-SRAS-R represents a refinement of the SRAS-R, aiming to feature more straightforward items. However, further refinement of the PTR factor is warranted, including potential modifications to existing items or the addition of new items. Previous evaluations of the SRAS-R have exhibited variability in study design, population (i.e., clinical or community), context, and analytic strategies, including differences in respondents (youth or parent), age groups, countries and translations, types of factor analysis, estimation methods in CFA, and approaches to addressing inadequate factor loadings. This variability in study procedures and analyses may hinder the meaningful accumulation of results across studies. A more consistent factor structure could potentially emerge with greater uniformity in analytic strategies across studies.

Based on the results of the current study together with the study in which the A-SRAS-R was developed [23], we recommend using the A-SRAS-R as an assessment instrument in a school-based community context. Comparing the A-SRAS-R with the SRAS-R, we observed that the psychometric properties of the A-SRAS-R were generally superior. Furthermore, the A-SRAS-R was developed to reduce the complexity of items, which can enhance its utility relative to the SRAS-R, as evident in our pilot testing, where many participants reacted on illogical response options. However, caution is advised

when interpreting the PTR in the A-SRAS-R due to its low internal consistency, raising questions about what the fourth factor truly measures.

Conclusion

This study represents the first evaluation of the Swedish A-SRAS-R, a modified version of the SRAS-R designed to address previous limitations, positioning it as a potentially preferable alternative to the SRAS-R. Our evaluation demonstrated adequate psychometric properties of the A-SRAS-R. Item removal further improved model fit. However, there were instances where the response format did not align well with the item content, and the PTR factor emerged as problematic. Hence, more than just replacing the last eight items of the SRAS-R, the factor PTR needs more elaboration. While the A-SRAS-R resolves some issues identified in prior evaluations by replacing problematic items, further work is required to improve its psychometric properties. Given the potential clinical utility of an assessment instrument like the A-SRAS-R, further development could greatly benefit practice.

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Author contributions

All authors participated in the study design. JS and KA conducted the data collection and data analysis. All authors contributed to the preparation of the manuscript and approved the final paper.

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Data availability

The dataset used and analyzed during the current study is available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

This study was conducted in accordance with the 1964 Declaration of Helsinki. This study was approved by the Swedish Ethical Review Authority (Dnr 2020–01976) in September 2020. Informed consent was obtained from all participants.

Consent for publication

Not applicable.

Competing interests

JS is affiliated with Magelungen Utveckling AB. DH, LFW, and KA declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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