Validation of the Amharic Version of the Sibling Relationship Questionnaire (SRQ) with a Sample of Adolescents in Addis Ababa꞉ A Focus on Warmth and Conflict

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Abstract

Quality of sibling relationship (QSR) contributes significantly to adolescents 'development; however, no study has validated an instrument to assess the quality of adolescents' sibling relationships with Ethiopian samples. The main purpose of this study was to translate and culturally adapt the Sibling Relationship Questionnaire (SRQ) into Amharic and test its psychometric properties. We conducted two studies. In study 1, the instrument underwent translation and back translation along with the inspection of content, semantic, conceptual and contextual equivalence, and pretesting to determine its clarity and understandability to the target group. Study 2 evaluated the psychometric properties by administering the translated SRQ to 291 adolescents aged 15 to 17in Addis Ababa. The result confirmed the dimensions of warmth/Closeness and conflict as major aspects of sibling relationships by preserving the original 17 items. Both factors and the global scale presented a good internal consistency. In conclusion, the result supported the use of the SRQ in Ethiopia. The finding implied that the Amharic version of SRQ may now be used as a tool for the early detection of the pathological relationship between adolescent siblings and to determine the effectiveness of intervention programs designed to improve sibling relationships among adolescents.

Keywords: SRQ-Amharic, Validation, Adolescents, Ethiopia

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Introduction

The introduction of the typological approach to parenting styles (Baumrind, 1991; Maccoby & Martin, 1983) created a conceptualization that child-rearing practices are universal and children of the same family are the same in their behavioral patterns depending on the type of parenting style parents install at home. Studies have found that an authoritative parenting style is associated with higher levels of parent–adolescent cohesion (Nelson et al., 2011), pro-social behavior (Zebene & Demissie, 2020), safe sexual practices (Amsale &Yemane, 2015), well-being (Ebabush & Ananda, 2018) and lower levels of conflict (McKinney et al., 2011). In contrast, authoritarian and neglectful parenting styles are associated with lower cohesion, higher conflict (McKinney et al., 2011), poor pro-social behavior (Zebene & Demissie, 2020), and poor well-being (Ebabush & Ananda, 2018).

The assumption that children of the same family have resemblance due to similarity in a family environment is changed due to the introduction of the concept of a non-shared family environment by Plomin and his associates. Non-shared family experiences are aspects of the family environment that make siblings brought up together. Indeed, regarding psychosocial development, the family environment makes siblings no more similar to one another than children picked at random from the general population (Plomin et al., 2001). One of the key aspects of non-shared family experience is the Quality of Sibling Relationship (QSR) (Furman & Buhrmester, 1985; Plomin et al., 2001)

Sibling relationships play a supreme role in the daily life of adolescents and are often among the most enduring relationships in an individual's life (Relva et al., 2017). The relationships can be characterized by a variety of emotional responses that includes

love and warmth as well as conflict and rivalry (Buist et al., 2013) and their influences are as strong as parent-child (Whiteman et al., 2015) and peer relationships influences (Francka et al., 2019).

Generally, implications of studies on sibling relationships indicated that siblings have significant exceptional effects on each other's development (Buist et al., 2013; Kim et al., 2006; Solmeyer et al., 2014) to the extent that it can significantly predict adjustment (Buist et al., 2013; Noller, 2005).

Because of increased interest in sibling relationships and their effect on developmental outcomes, several measurement tools are available to assess the quality of sibling relationships. For example, the Sibling Inventory of Behavior (SIB) (Schaefer & Edgerton, 1981) was originally developed to assess the quality of sibling relationships in families of a child with developmental disabilities. On the other hand, the Sibling Relationship Inventory (SRI), which was created by Stocker and McHale (1992), was meant to assess sibling relationship quality among children at the early and late childhood stages based on parental responses. The other predominantly used sibling relationship inventories were the Adult Sibling Relationship Questionnaire (ASRQ) (Stocker et al., 1997) and the Lifespan Sibling Relationship Scale (LSRS) (Riggio, 2000). They are designed to assess the quality of sibling relationships during late adolescence and beyond.

Despite the effect of the quality of sibling relationships on adolescents' development, there are no ample instruments that could be applied to examine QSR during adolescence stage. The Sibling Relationship Questionnaire (SRQ) (Furman & Buhrmester, 1985) is the commonly used assessment tool to measure QSR during adolescence. Although the questionnaire has been used in several studies (e.g. Richmond et al., 2005; Stocker et al., 2002; Van der Vorst et al., 2006), there is little evidence on the factorial and construct validity of the instrument (Derkman et al., 2010).

SRQ and the other existing measures were also developed and validated based on evidence of samples from the West and ratified to be applied in Western cultures. In Ethiopia, the issue of a non-shared family environment is the least focused area partly may be due to a lack of locally adapted measurement instruments. There are no contextualized, valid and reliable measurement tools in Ethiopia to evaluate the quality of sibling relationships among adolescents.

Validation of SRQ with a sample of adolescents in Ethiopia would allow researchers to study the unique implications of sibling relationships for adolescents' adjustment. Amharic is the mother tongue of about 35% of the population (Eberhard et al., 2021) and the country's working language. Therefore, this study aimed to culturally adapt and investigate the psychometric properties of the Amharic version of the Sibling Relationship Questionnaire (SRQ). To meet the intended purpose, two studies were conducted to address two major themes of cross-cultural tool adaptation and validation: translation and adaptation and psychometric validation.

Study 1: Translation and Cultural Adaptation of SRQ
Overview

The aim of study 1 was to translate and culturally adapt the SRQ into Amharic to be used with adolescents using the standard method to promote semantic, content, conceptual, and contextual equivalence with the original instrument.

Methods

Participants

Three major assessments were carried out in this study: 1. forward translation/back translation, content validity analysis, and pretesting. Different participants took part in these three stages. The literature recommends that the translation of research tools should be done by two language experts who are fluent in

the source language and native to the target language (Beatonet al., 2000; Reichenheim et al., 2007). Accordingly, two experts in English language (Ph.D. holders) and native Amharic speakers were used to translate the instrument from English language into Amharic language. Additionally, other two language professionals (Ph.D. holders) were also used as back translators of the tool from the target language to the source language.

Pilot and Beck (2006) stated that content validity is traditionally assessed by computing the content validity index (I-CVI), using ratings of item relevance of five to ten experts. In the present study content validity assessment was carried out by 10 professionals who have methodological and theoretical expertise. Four experts were Ph.D. psychology students of Addis Ababa University in the year 2022 who were writing their dissertations on related topics. The other four experts were Hawassa University Psychology Department members who had a Ph.D. in psychology and were experienced in conducting studies on similar areas. The remaining two were practitioners (MA degree holders in developmental psychology) who have worked for more than 10 years in NGOs that support children and adolescents.

The tool pretesting was done using randomly selected 31 (15-17 years old) students from the target group. Beaton et al. (2000) claimed that 30 to 40 respondents are adequate for instrument pretesting to detect confusing or misleading items. The pretest participants of this study were from intact families and had at least one closer-age sibling at home. They evaluated the overall features of the instrument and whether or not the sentences were clear and easy to understand, with appropriate layouts and presentations.

Procedures

The adaptation of SRQ was informed by a model stated by Hambleton (2005). The model entails five steps in cross-cultural instrument adaptation: (1) forward translation from the source language into the target language, (2) synthesis of the translated versions, (3) back-translation from the target language into the source language, (4) synthesis on the back-translated versions and (5) pilot testing.

The adaptation and validation of the tools of this study were carried out in two major phases, each encompassing different activities. Phase one was the translation and adaptation of the original tool in English language into Amharic language. In this phase, four major activities were conducted. First, the forward translation of the tool into the Amharic language was carried out by using two language experts independently. Second, review and discussion meetings were held on the two Amharic Versions with the translators to ensure the five types of equivalences (Content, semantic, criterion, technical and conceptual) (Flaherty et al.,1988), and a consensus was reached on the draft Amharic version.

Content equivalence was examined by critically synthesizing the contents of each instrument against the constructs under study in the new culture. Content equivalence was also critically assessed by using expert judgment to ensure the content validity of the instruments. Semantic equivalence was assessed by examining whether or not the words in the English and Amharic versions have the same meaning and whether or not the items have more than one meaning. Idiomatic (criterion) equivalence was examined by assessing whether or not items that are difficult to translate from the original language were changed into equivalent expressions that have not changed the cultural meaning of the item. Technical equivalence is evaluated to ensure the particular item applies to the new culture. Finally, conceptual equivalence is determined to assess

whether or not a given term or expression refers to the same aspect in both the original and target cultures.

Third, the Amharic version was back-translated into the original language by two language experts to evaluate the extent to which the translated version reflected the item content of the original version. Fourth, a review and discussion were held on the back-translated tool with the translators to identify modification areas and produce a more refined Amharic version tool for the validation phase.

Phase two was the evaluation of the face and content validity of the instrument. The 10 experts were given a list of items and the constructs the items were supposed to measure. The definitions of the constructs were also given in the introduction sections of the tools. The experts were asked to judge the items on a four-point scale (1=not relevant to 4=very relevant) from which the content validity index was determined during analysis.

The Amharic version was pretested for face validation by using 31 respondents from the target group. The clarity and comprehension of the Amharic version tool were assessed through a four-point Likert-scale response. For clarity, the scale ranged from a score of 1 (not clear at all) to 4 (very clear), and for comprehension from 1 (unable to understand at all) to 4 (easily understood).

Data Analysis

Item Level Face Validity Index (I-FVI), Item Level Content Validity Index, and Scale Level Content Validity Index (S-CVI) were computed to examine the face validity and content validity of the instrument. CVI was determined by averaging the proportion of items rated relevant across experts (Lynn, 1986). According to Polit et al. (2007), a content validity index of 0.80 and above is going to be considered to have acceptable content validity. Similarly, the FVI was also computed by determining the

proportion of rater giving ratings of clear/understandable or very clear/very understandable. An I-FVI of 0.80 and above are considered clear and understandable (Yusoff, 2019).

Results

Translation and Adaptation of SRQ

The two Amharic versions of the SRQ that were produced by the two forward translators were reviewed, compared, and discussed by the panel of translators and the researchers to produce a single Amharic version of the tools. The evaluation of the two Amharic version instruments was done for each item separately based on five major evaluation points: Content equivalence, semantic equivalence, criterion equivalence, conceptual equivalence, and technical equivalence.

The analysis of the two Amharic versions showed that the translation was similar for most items. This was confirmed during the review and discussion among the translators and the researchers. During the discussion, it was identified that there was a semantic error on two items (Items 14 and 28). An agreement was reached to make corrections and rephrase the items. Word correction, item rephrasing, and grammatical correction were also introduced on five items (Items 2, 9, 13, 21 and 29) during the panel among the researchers and the translators. The discussants also agreed on the relevance of the items to the specific group, the relevance of the items to measure the constructs, the appropriateness of the language to the target group, and the applicability of the instrument. The review and discussion on the backward translated versions also supported the assertion that the instrument was well adapted to the target group.

Content and Face Validation

Table 1; Face Validity and Content Validity Index of SRQ

Item number	I-CVI	I-FVI Clarity	Comprehension	Universal
	1.00	0.83	0.87	0.85
	1.00	0.90	0.93	0.91
	1.00	0.93	0.93	0.93
	0.70	0.87	0.80	0.83
	1.00	0.96	0.93	0.95
	0.90	0.96	0.87	0.91
	1.00	0.80	0.83	0.82
	1.00	0.93	0.83	0.88
	0.90	0.96	0.96	0.96
	1.00	0.87	0.93	0.90
	1.00	0.83	0.90	0.87
	1.00	0.93	0.93	0.93
	1.00	0.83	0.93	0.88
	0.70	0.93	0.90	0.91
	1.00	0.93	0.93	0.93
	0.90	0.87	0.83	0.85
	1.00	0.90	0.87	0.88
	1.00	0.90	0.93	0.91
	0.80	0.96	0.96	0.96
	1.00	0.87	0.77	0.82
	1.00	0.83	0.90	0.87
	0.70	0.96	0.93	0.95
	1.00	0.93	0.93	0.93
	0.70	0.87	0.93	0.90
	0.90	0.80	0.90	0.85
	1.00	0.80	0.74	0.77
	1.00	0.87	0.87	0.87
	0.60	0.93	0.93	0.93
	0.60	0.93	0.90	0.91
	1.00	0.93	0.90	0.91
	S-CVI	0.91		

Generally, the Amharic version sibling relationship questionnaire was found to have a satisfactory content validity (S-CVI=0.91). Analysis of I-CVI indicated that experts agreed on the appropriateness and relevance of the majority of the items to measure the constructs. However, three items from the closeness/warmth construct

(Items 22, 28 and 29) and two items from the conflict construct (14 and 24) were found to indicate a lower item validity index. The items were rephrased and modified in a way that could easily be understood and that could measure the specified constructs under study. Even though items 28 and 29 have lower item validity index values, they were retained with necessary adjustments.

I-FVI ranges from 0.82 to 0.96 except for one item (item 26 with I-FVI=0.77). The item was modified and stated differently by making sure that the item would measure the construct it was supposed to measure. Similarly, a modification was made on one item (item 20) because the value of a specific measure (comprehension) was found to be marginally lower (I-FVI=0.77) than the expected standard (I-FVI >0.80). All the remaining items were found to have satisfactory face validity. The overall analysis indicated that the translation and adaptation of SRQ was done well.

Study 2: Psychometric Validation

Overview

The aim of study two was to examine the factor structure of the translated SRQ and its psychometric properties, including construct validity and internal consistency.

Methods

Participants

A multistage random sampling method was employed to select the participants for the study. In the first stage, among 11 sub-cities of Addis Ababa City Administration, three sub-cities were selected (Yeka, Kirkos, and Nefas Silik Lafto) randomly using a lottery method. There were 21 schools in the three sub cities (Yeka=7, Kirkos=5 and Nefas SilikLafto= 9). In the second step, three secondary schools were

selected (one from each sub-city) randomly. Minilik, Fitawrari Lake and Abyot Kirs secondary schools were selected as study sites.

Once the schools and number of classes were identified, the next step was distributing preliminary assessment for each section to determine eligible samples for the present study. There were a total of 1918 students in the three schools of which 1287 were eligible to be considered as participants for the study (were living with intact families and had at least one same sex closer age sibling). Tabachnick and Fidell (2007) proposed 300 participants as an adequate sample size for psychometric analysis of data collection tools. On the other hand, Nunnally (1978) suggested that sample size should be determined by the number of items in the tool and recommended an item ratio of at least 10:1 as an adequate sample size in most cases. Based on the above guidelines, for the present study, to validate a tool with a total of 30 items, the minimum sample size required was 300. By adding a contingency for a 10% non-response rate, a total of 330 participants were selected from the three schools proportionally and randomly (140=Fitawrari Lake, 100= AbyotKiris, 90=Minilik II Schools).

Measure

SRQ is a self-report measure, composed 48 items. It was designed to measure dimensions of Conflict, Relative Status/Power, Warmth/Closeness, and Rivalry (Furman &Buhrmester, 1985). Warmth and conflict are basic aspects to explain sibling relationships (Kim et al., 2006; Richmond et al., 2005; Scharf et al., 2005) and to predict adjustment during the adolescence stage (Stocker et al., 2002; Kim et al., 2007). Derkman and his associates (2010) validated SRQ with a Dutch adolescent sample and confirmed that warmth/closeness and conflict are the two key constructs to measure quality of sibling relationship. Thus, in this study, the warmth/closeness and conflict dimensions of SRQ were considered as measures of sibling relationship quality among

adolescent participants. The 30 items SRQ was intended to measure warmth/closeness (21 items), and conflict (9 items) that is developed on a 5-point Likert-type scale (1 = hardly at all, 2 = not too much; 3 = somewhat, 4 = very much, and 5 = extremely much). The 21 items measured the extent of warmth/closeness among adolescents; higher values indicate a quality relationship. Similarly, the summation of values of items of the conflict scale tells the extent of sibling conflict, higher scores indicate more sibling conflict.

Procedures

The translated and adapted Amharic version of SRQ was pilot tested on the sample target participants, who did not participate in face validation. All of the participants were informed about the nature of the research and the objective of the study. It was made clear that participation was voluntary and that all data would remain confidential. The questionnaire was individually administered during school time. The respondent adolescents replied to the questions referencing the closer age sibling at home. The data collection was carried out for about two weeks (January 8-21/2022) with the help of five trained assistants.

Data Analysis

Data cleaning and encoding tasks were done by the researchers as a preliminary activity of data analysis. The cleaned data were subject to analysis using SPSS version 25 to meet the study's intended purpose. Factor analysis was carried out to determine the factor structure of the scale. The analysis of the data was performed by strictly adhering to the assumptions of each statistical data analysis.

Before performing factor analysis, the suitability of the data for dimensionality analysis was determined using the Kaiser-Meyer-Olkin (KMO) value and Bartlett's test

of specificity. The extraction method performed was principal component analysis with direct Oblimin rotation. Only those items with a factor loading above 0.55 in a single factor were retained (Comrey& Lee, 1992). The factors were extracted based on the results of screen plot with eigenvalues>1.0 (with a maximum 5% variance per factor).

Confirmatory factor analysis was conducted to test whether or not the data would fit in to the existing hypothetical factor structure. The CFA model fit was assessed using several indicators: Chi-square value (X^2/df), Comparative Fit Index (*CFI*), Tucker-Lewis Index (*TLI*), Root Mean Square Error of Approximation (*RMSEA*), and Standardized Root Mean Residual (*SRMR*). X^2/df lower than 5 (Hooper et al., 2008), CFI and TLI ($\geq$ .90) (Hu &Bentler, 1999), RMSEA ($<$ .08)(MacCallum et al., 1996), and SRMR ($<$ .09) (Hu &Bentler, 1999) indicate a good fit. If model refinement was deemed necessary, standard use of modification indices was undertaken (Brown, 2006) with a cutoff value of 10 (Tobit, 1989).

Measurement of invariance was computed to determine whether or not the items measured the same construct across different groups (older vs. younger and male vs. female).

Finally, the internal consistency was also assessed by computing Cronbach's alpha for each subscale, as well as the main scale. Cronbach's α is considered to be satisfactory if the values are greater than .70 (Nunnally & Bernstein, 1995).

Results

The culturally adapted Amharic version of SRQ was distributed to 330 eligible adolescent participants. Three hundred five copies of the questionnaire were returned (92% response rate) of which 14 copies were discarded due to incomplete information. Finally, information from 291 participants was considered for pilot testing.

Table 2:Demographic Characteristics of the Participants

Variable	Level	Frequency	Percent
Grade level	Grade 9	74	25.4
	Grade 10	217	74.6
Gender	Male	95	32.6
	Female	196	67.4
Birth order	Younger	150	51.5
	Older	141	48.5
Variable		**Mean**	**SD**
Age of respondents		16.74	1.31
Age of the closer age sibling		16.88	2.71
Number of siblings at home		3	1.73

The majority of the participants were taken from grade 10 (74.6%) and (67.4%) were females the participants had at least one closer aged sibling at home. A similar proportion of older and younger participants took part in the study. The mean age of the respondents was 16.74 (SD=1.31) and the mean age of the sibling with closer age to the respondent adolescent was 16.88 (SD=2.71).

Results of Factor Analysis and Internal Consistency of SRQ

Construct validity

For exploratory factor analysis, the 30 items of the SRQ were subjected to the principal component analysis (PCA). Before performing PCA, the suitability of the data for factor analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients of 0.3 and above. The Kaiser-Meyer-Olkin value was 0.873, exceeding the recommended value of 0.6 (Nkansa, 2018) and Bartlett's Test of Specificity (Bartlett, 1954) reached statistical significance *(X^2=3400.78; df=435, p<0.001)* supporting the factorability of the correlation matrix.

Table 3: Item loadings of SRQ (n=291)

	Pattern coefficients		Structure coefficients		Communalities
Items	Component 1	Component 2	Component 1	Component 2	
SRQ22	**.766**	-.058	**.770**	-.113	.313
SRQ18	**.713**	.170	**.718**	-.222	.434
SRQ29	**.711**	.031	**.709**	-.021	.125
SRQ12	**.705**	-.171	**.700**	.118	.444
SRQ19	**.689**	.114	**.681**	.063	.243
SRQ28	**.674**	-.010	**.675**	-.059	.360
SRQ8	**.647**	-.198	**.661**	-.245	.179
SRQ11	**.643**	-.187	**.656**	-.234	.476
SRQ21	**.636**	-.009	**.636**	-.055	.393
SRQ2	**.617**	-.191	**.631**	-.236	.466
SRQ9	**.615**	-.082	**.621**	-.127	.465
SRQ13	**.576**	-.134	**.585**	-.176	.544
SRQ6	**.572**	-.147	**.582**	-.189	.360
SRQ23	**.564**	.045	**.561**	.004	.306
SRQ16	**.562**	.039	**.559**	-.002	.247
SRQ1	**.551**	-.062	**.556**	-.102	.314
SRQ5	**.494**	.050	**.490**	.014	.327
SRQ15	**.492**	.118	**.483**	.082	.519
SRQ27	**.460**	.140	**.453**	-.007	.477
SRQ25	**.455**	.026	**.450**	.106	.543
SRQ26	**.372**	.201	**.358**	.174	.405
SRQ3	**.355**	.036	**.352**	.010	.596
SRQ20	.002	**.737**	-.051	**.737**	.317
SRQ10	.025	**.684**	-.024	**.682**	.382
SRQ4	-.075	**.657**	-.123	**.662**	.206
SRQ30	.010	**.656**	-.038	**.655**	.168
SRQ24	-.004	**.618**	-.049	**.618**	.222
SRQ17	.083	**.572**	.041	**.566**	.455
SRQ7	.015	**.424**	-.358	**.447**	.504
SRQ14	-.327	**.424**	-.016	**.423**	.430

Note: items with strong loading are bolded.

PCA revealed the presence of 7 component factors with eigen values exceeding 1, explaining 26.86%, 10.54%, 6.25%, 4.96%, 4.19%, 3.84%, and 3.53% of the variance respectively. An inspection of the screen plot revealed a clear break after the

second component. Using Catell's screen test, it was decided to retain two components for further investigation.

The two-component solution explained a total of 37.40% of the variance, with component 1 contributing 26.86% and component 2 contributing 10.54%. To aid the interpretation of these two components, oblimin rotation was performed. The rotation revealed the presence of a simple structure with both components showing a number of strong loadings and all variables loading substantially on only one component.

The interpretation of the two components was consistent with the previous research on SRQ, with closeness/warmth components loading on component 1 and conflict component items loading strongly on component 2. Six items (3, 5, 15, 25, 26 &27) belonging to the closeness sub-scale and two (7 &14) belonging to the conflict subscale did not present satisfactory loadings. The results of the analysis support the use of closeness/warmth items and conflict items as separate scales, as suggested by the scale authors.

Confirmatory factor analysis

The 22 items of the Amharic version of the SRQ were subjected to CFA to test the two-factor model proposed by Furman and Buhrmester (1985). The model included estimates of the covariance between factors consistent with a previous study (Derkman et al., 2010).
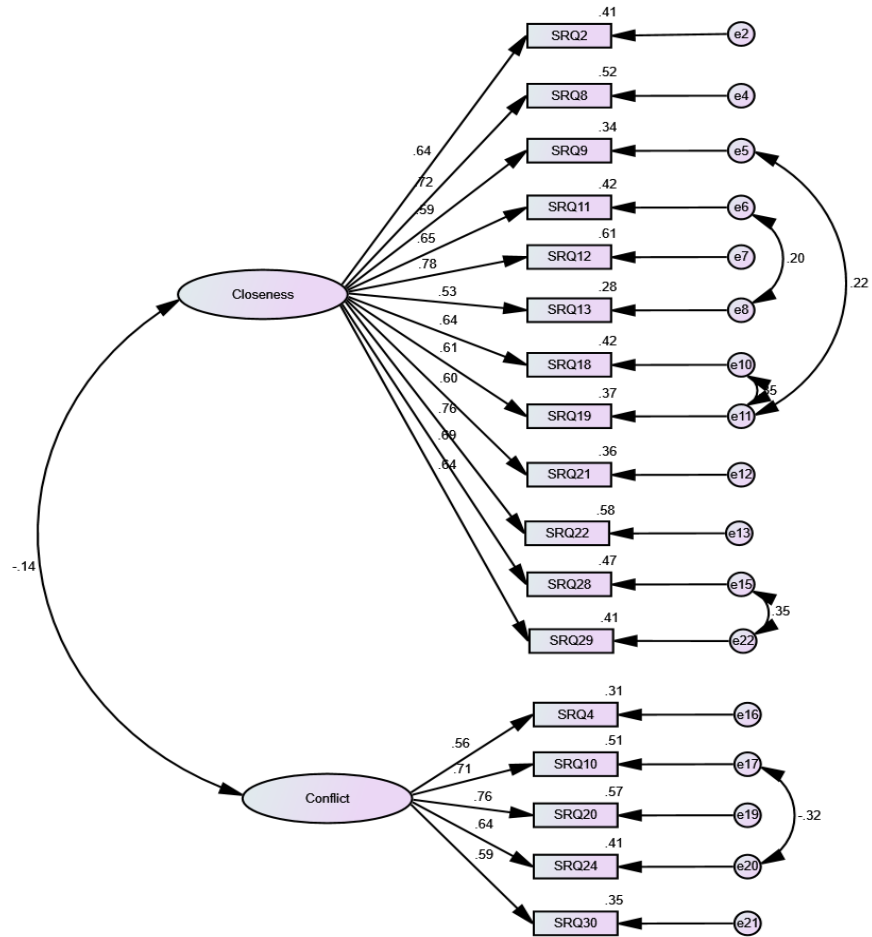
Figure 1: *Factor Structure Model and Estimated Value of the Standardized Loadings of the Amharic version SRQ*

The analysis resulted in a 17-item instrument of which 12 items measured sibling warmth/closeness and 5 of them measured sibling conflict. The analysis of the model fit indices revealed that despite Chi-square being significant, $(X^2(113) = 234.11,$

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p<0.001) the model fits with the hypothetical model. Assessment of model fit indices (Table 4 below) indicated that *X²/df = 2.07, RMSEA=0.06, CFI=0.94, TLI=0.93,* and *SRMR=0.08*showing that the model fit is satisfactory to the hypothetical model.

Table 4: Model fit indices of the Amharic version SRQ

RMSEA	CFI	TLI	SRMR
0.06	0.94	0.93	0.08

Results of Multiple Group Test of Invariance between Age Group and Gender

To make sure that the adapted instrument measures the same concept in similar way across gender and age groups (birth order); we conducted tests for measurement invariance.

Multi-group CFA was carried out that included three models: Configural (model1 i.e. all the items loading on the underlying concepts of closeness and conflict); metric invariance model that constrained all factor loadings being equal across groups(model 2) and scalar invariance model that constrained all factors loading and items intercepts being equal across the group(model 3). The three models were applied to sets of groups [age group, (older vs. younger) and gender (male vs. female)]. Measurement invariance in the multi-group CFA was assessed by comparing Model 1 with 2 for metric invariance and Model 2 with 3 for scalar invariance (Bagheri et al., 2014), with the following fit indices suggesting invariance: ΔCFA>=-0.01, ΔRMSAE<0.015 (Chen, 2007)

Table 5: Measurement of Invariance Indexes for Gender and Birth Order

Model	X²(df)	ΔX²	CFI	ΔCFI	RMSEA	ΔRMSEA
Birth order invariance						
Configural	423.37(226)		0.897		0.055	
Metric	439.37(241)	16(15)	0.897	0.000	0.053	0.002
Scalar	450.90(244)	11.53(3)	0.893	-0.004	0.054	0.001
Gender invariance						
Configural	449.90(226)		0.879		0.059	
Metric	474.46(241)	24.46(15)	0.874	0.005	0.058	0.001
Scalar	483.57(244)	9.11(3)	0.871	0.003	0.058	0.000

Measurement of invariance fully supported the SRQ across birth order in metric invariance *(ΔCFI=0.000, ΔRSMEA=-0.004)* and scalar invariance *(ΔCFI=-0.004, ΔRMSEA=-0.001)*. Similarly, measurement invariance fully supported the SRQ across gender in metric invariance *(ΔCFI=0.005, ΔRSMEA=-0.001)* and scalar invariance *(ΔCFI=-0.003, ΔRMSEA=-0.000)*.Generally, the data presented in Table 5 above shows an adequate fit with the model.

Reliability

The internal consistency analysis (Table 6) indicated that the alpha reliability coefficient for SRQ is found to be acceptable for the global scale (α=0.83) as well as sub-scales of closeness and conflict (α=0.90 and 0.78, respectively).

Table 6:Correlated item-total correlation and Cronbach's alpha if item deleted for Amharic version of SRQ

Scales	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Warmth/Closeness α=0.90		
SRQ2	.59	.89
SRQ8	.67	.89
SRQ9	.57	.89
SRQ11	.60	.89
SRQ12	.71	.89
SRQ13	.50	.90
SRQ18	.63	.89
SRQ19	.63	.89
SRQ21	.57	.89
SRQ22	.71	.89
SRQ28	.65	.89
SRQ29	.64	.89
Conflict α=0.78		
SRQ4	.50	.75
SRQ10	.54	.73
SRQ20	.64	.70
SRQ24	.51	.75
SRQ30	.54	.74

Discussion

Since the quality of sibling relationships is so important for adolescents' adjustment, we intended to adapt and validate SRQ that could help professionals and researchers to evaluate the relationship. Based on the researchers' knowledge, this is the first instrument adapted to assess the quality of sibling relationships based on perceptions of Ethiopian adolescents. In this study, we sought to translate and adapt as well as explore the psychometric properties of SRQ in a sample of Ethiopian adolescents. We also tested the theoretical model underlying the instrument.

In study 1, we reported the process of translating and culturally adapting the SRQ into Amharic to be used with Ethiopian adolescent samples aged 15 to 17 years old. The content, semantic, conceptual and contextual equivalence between the original version and the Amharic version of the instrument was supported by a positive evaluation of the back translation of the instrument. The pretesting task identified that the tool was properly translated and adapted to be used for adolescent participants. The results obtained from the pretest reveal that all the items level face validity index were above the acceptable threshold of 0.8, thereby indicating that the tool under consideration is valid as per the established standards (Yusoff, 2019). Furthermore, the adapted instrument exhibited a commendable S-CVI of 0.91, which bolsters the notion of its validity (Polit et al., 2007).

In study 2, the factorial structure of the SRQ was examined along with its reliability for use with Ethiopian families. Examination of the responses of the participants, the Amharic SRQ revealed a two-factor structure that preserved the 17 original items (Furman & Buhrmester, 1985). The items loaded on the warmth scale in the original instrument loaded on the same factor in the Amharic version. Similarly, the items loaded in the conflict factor of the original instrument were loaded in the same

factor in the Amharic version. Factor analysis on the tool by O'Neill and his associates (2015) come up with the same factor loading as the original instrument in their attempt at factorial and construct validity of SRQ. Studies carried out in determining constructs of SRQ consistently yielded a two-factor model (Derkman et al., 2010; Sabah, 2019) Therefore, we can confirm that the theoretical model of the SRQ and conclude that the SRQ measures Warmth and Conflict in sibling relationships in the same way across culture.

Evidence for measurement invariance confirmed the theoretical model of SRQ and concludes that the SRQ measures Warmth and Conflict in the same way across gender and birth order.

Concerning the reliability of the SRQ, for both dimensions the internal reliability scores were high. Similarly, Furman and Buhrmester (1985), Derkman et al. (2010) and Sabah (2019) similarly reported high internal consistency coefficients for the two qualities.

Conclusion

The two factors (sibling warmth and conflict) Amharic version of SRQ is a valid and reliable tool to measure quality of sibling relationship among Amharic speaking adolescents in Ethiopia.

Strength and limitations

The study confirmed the theoretical structure of SRQ stated by the original authors. We used EFA and CFA to determine the factor structure and compare whether the tested model corresponds to the stated model by the tool's original developers. Our finding underscores the psychometric properties of the SRQ which appeared to be a reliable and valid measurement to assess Warmth and Conflict in sibling relationships.

However, since this is the first attempt at the validation of SRQ in a culture and context completely different from the context of the original study, further studies are

required to confirm the stability of the constructs in other cultures of Ethiopia. Similarly, this study was not able to determine the convergence validity due to lack of comparable Amharic version measures in the study area. We also encourage researchers to carry out tests that determine the consistency of reliability over time.

Implications

The Amharic version of the SRQ has acceptable reliability and validity to be used by professionals and practitioners in practical/intervention and research settings. It can also be used as a pre-test and post-test measure to determine the effectiveness of interventions and strategies implemented with the intention of improving sibling relationships. Additionally, the validation of SRQ provides the opportunity to compare the results obtained in Amharic-speaking samples with those obtained in other countries to carry out cross-cultural studies.

References

Amsale C.,&Yemane B. (2015). Assessment of parenting practices and styles and adolescent sexual behavior among high school adolescents in Addis Ababa, Ethiopia. *Journal of AIDS and Clinical Research*, *6*(2), 424.http://doi.org/10.4172/2155-6113.1000424

Bagheri, Z.. , Jafari, P.. , Tashakor, E., Kouhpayeh, A., &Riazi, H. (2014). Assessing whether measurement invariance of the KIDSCREEN-27 across child-parent dyad depends on the child gender: A multiple group confirmatory factor analysis. *Global Journal of Health Science*, 6(5), 142–153. http://doi.org/10.5539/gjhs.v6n5p142

Bartlett, M. S. (1954). A Note on the multiplying factors for various χ2 aApproximations.*Journal of the Royal Statistical Society, 16*(2), 296–298.

Baumrind, D. (1991). The influence of parenting style on adolescent competence and substance abuse."*Journal of Early Adolescence*, *11*(1), 56-– 95.

Beaton, D.E., Bombardier, C., Guillemin, F., &Ferraz, M. B. (2000). Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine, 25*, 3186-3191. http://doi.org/10.1097/00007632-200012150-00014.

Buist, K.L., Dekovic, M., &Prinzie, P. (2013). Sibling relationship quality and psychopathology of children and adolescents: A meta-analysis. *Clinical Psychology Review, 33*, 97–106. http://doi.org/ 10.1016/j.cpr.2012.10.007.

Comrey, A. L., & Lee, H. B. (1992). *A first course in factor analysis* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Derkman, M. M. S., Scholte, R. H. J., van Der veld, W. M., & Engels, R. C. M. E. (2010). Factorial and construct validity of the Sibling Relationship Questionnaire. *European Journal of Psychological Assessment,26*(4), 277-283.

Ebabush, Y., &Ananada, R. (2018). Psychological well-being of Eethiopian adolescents in relation to family structure and parenting style. *IMPACT: International Journal of Research in Humanities, Arts and Literature (IMPACT: IJRHAL)*, *6*(12), 185-196.

Eberhard, D. M., Simons, G. F.,&Fennig, C. D. (2021). *Ethnologue: Ethiopia*. Ethnologue. SIL International.

Flaherty, J. A., Gaviria, F. M., Pathak, D., Mitchell, T., Wintrob, R., Richman, J. A., &Birz, S. (1988). Developing instruments for cross-cultural psychiatric research. *Journal of Nervous & Mental Disease*, *176*(5), 260–263. https://doi.org/10.1097/00005053-198805000-00001

Francka, B. A., Lindell, A. K., & Campione-Barr, N. (2019). The relative impacts of sibling relationships on adolescent body perceptions. *The Journal of Genetic Psychology*, *180*(2-3), 130-143.*http://doi.org/10.1080/00221325.2019.1602024*

Furman, W., &Buhrmester, D. (1985). Children's perceptions of the qualities of sibling relationships. *Journal of Child Development*, *56*, 448-461.

Hambleton, R. K. (2005). Issues, designs, and technical guidelines for adapting tests into multiple languages and cultures. In R. K. Hambleton, P. F. Merenda, & C.D. Spielberger (Eds.), *Adapting educational and psychological tests for cross-cultural assessment* (pp. 3–38). Mahway, NJ: Lawrence Erlbaum Associates.

Hooper, D., Coughlan, J., & Mullen, M. (2008). Structural equation modeling: Guidelines for determining model fit. *The Electronic Journal of Business Research Method*, *6*(1), 53-60.

Hu, L., &Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1–55.

Kim, J., McHale, S. M., Crouter, A. C., & Osgood, D. W. (2007). Longitudinal linkages between sibling relationships and adjustment from middle childhood through adolescence. *Developmental Psychology, 43*, 960–973.

Kim, J., McHale, S. M., Osgood, D. W., &Crouter, A. C. (2006). Longitudinal course and family correlates of sibling relationships from childhood through adolescence. *Child Development*, *77*, 1746–1761.

MacCallum, R.C., Browne, M. W.,& Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods, 1*(2), 130-49.

Maccoby, E. E., & Martin, J. A. (1983). Socialization in the context of the family: Parent-child interaction. In P. H. Mussen, & E. M. Hetherington (Eds.), *Handbook of Child Psychology*: Vol. 4. *Socialization, Personality, and Social Development* (pp. 1-101). New York: Wiley.

McKinney, C., Milone, M. C., &Renk, K. (2011). Parenting and late adolescent emotional adjustment: Mediating effects of discipline and gender. *Child Psychiatry and Human Development, 42*(4), 463–481. https://doi.org/10.1007/s10578-011-0229-2

Nelson, L. J., Padilla-Walker, L. M., Christensen, K. J., Evans, C. A., & Carroll, J. S. (2011). Parenting in emerging adulthood: Aan examination of parenting clusters and correlates. *J. Youth Adolesc.40*, 730–743. http://doi.org/10.1007/s10964-010-9584-8

Noller, P. (2005). Sibling relationships in adolescence: Learning and growing together. *Personal Relationships, 12*, 1–12.

Nunnally, J.O. (1978). *Psychometric theory*. New York: McGraw-Hill.

Nunnally, J., &Bernstein, I. H. (1995). *Psychometric theory*. New York, NY: McGraw-Hill.

O'Neill, D.,Talanti, K., McCarthy, G.,Adamis, D.,&Tsamparli, A. (2015). Psychometric analysis of the Greek version of the Sibling Relationship Questionnaire (SRQ). *European Psychiatry, 30*(1), 304.

Plomin, R., Asbury, K.,&Dunn, J. (2001). Why are children in the same family so different? Nonshared environment a decade later. *The Canadian Journal of Psychiatry, 46*(3), 225–233. http://doi.org/10.1177/070674370104600302

Polit, D. F., Beck, C. T., & Owen, S. V. (2007). Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Research in Nursing & Health, 30*(4), 459-467. http://doi.org/10.1002/nur.20199

Reichenheim, M. E., &Moraes, C. L. (2007). Operationalizing the cross-cultural adaptation of epidemiological measurement instruments. *Revista de saúdepública*, *41*, 665-673.http://doi.org/10.1590/S0034-89102006005000035.

Relva, I. C., Fernandes, O. M., &Alarcão, M. (2017). Dyadic types of sibling sexual coercion. *Journal of Family Violence, 32*(6), 577–583. https://doi.org/10.1007/s10896-017-9918-3

Richmond, M. K., Stocker, C. M., & Rienks, S. L. (2005). Longitudinal associations between sibling relationship quality, parental differential treatment, and children's adjustment. *Journal of Family Psychology*, *19*(4), 550-559.http://doi.org/10.1037/0893-3200.19.4.550

Riggio, H. R. (2000). Measuring attitudes toward adult sibling relationships: The Lifespan Sibling Relationship Scale. *Journal of Social and Personal Relationships, 17*(6), 707–728. http://doi.org/10.1177/0265407500176001.

Sabah, A. (2019). Standardization of Sibling Relationship Questionnaire in a sample of Algerian Adolescents. *Journal of Educational & Psychological Sciences*, *20*(03), 551-587.

Schaefer, E. S., & Edgerton, M. (1981). *The sibling inventory of behavior*. Chapel Hill, NC: University of North Carolina.

Scharf, M., Shulman, S., &Avigad-Spitz, L. (2005). Sibling relationships in emerging adulthood and in adolescence. *Journal of Adolescent Research, 20*, 64–90.

Solmeyer, A. R., McHale, S. M., &Crouter, A. C. (2014). Longitudinal association between sibling relationship qualities and risky behavior across adolescence. *Developmental Psychology, 50*, 600–610. http://doi.org/10.1037/a0033207.

Stocker, C. M., & McHale, S. M. (1992). The nature and family correlates of preadolescents' perceptions of their sibling relationships. *Journal of Social and Personal Relationships, 9(2), 179–195.* http://doi.org/10.1177/0265407592092002

Stocker, C. M., Burwell, R. A., & Briggs, M. L. (2002). Sibling conflict in middle childhood predicts children's adjustment in early adolescence. *Journal of Family Psychology, 16*, 50–57.

Stocker, C. M., Lanthier, R. P., & Furman, W. (1997). Sibling relationships in early adulthood. *Journal of Family Psychology, 11*(2), 210–221.http://doi.org/10.1037/0893-3200.11.2.210

Tabachnick, B. G., &Fidell, L. S. (2007). *Using multivariate statistics (5thed.).* Boston, MA: Allyn & Bacon.

Van der Vorst, H., Engels, R.C.M.E., Meeus, W., &Deković, M., Vermulst, A. (2006). Parental attachment, parental control, and early development of alcohol use: A longitudinal study. *Psychology of Addictive Behaviors, 20*(2), 107–116.

Whiteman, S. D., Solmeyer, A. R., & McHale, S. M. (2015). Sibling relationships and adolescent adjustment: Longitudinal associations in two-parent African American families. *Journal of Youth and Adolescence, 44*(11), 2042–2053. http://doi.org/10.1007/s10964-015-0286-0

Yusoff, M. S. B. (2019). ABC of content validation and content validity index calculation. *Education in Medicine Journal, 11*(2), :49-54. https://doi.org/10.21315/eimj2019.11.2.6

Zebene, T., &Demssie, T. (2020). The role of parenting style in instilling adolescents pro-social bbehavior: Tthe case of adolescent students in Arba-minch, Konso, and Jinka, Southern Ethiopia. *American Journal of Applied Psychology, 9*(1), 22-33. http://doi.org/10.11648/j.ajap.20200901.14