Ethiopian Journal of Behavioral Studies, 2024, 7(2), 141-180

Validation of the Tromso Social Intelligence Scale (TSIS) in the Ethiopian Context

Dawit Demlie[1] and Tamirie Andualem[2]

Received: 16 February 2024; Accepted: 13 October 2024

Abstract

This study aimed to validate the psychometric properties of the Tromso Social Intelligence Scale (TSIS) in its Amharic version. Employing a random sampling method, year three and above undergraduate public university students (n = 343) in the full-time academic program of Dire Dawa and Wollo universities participated in the study. We examined factor structure, model fitness, reliability, and validity of the construct. After removing two poorly functioning items, the result of exploratory factor analysis showed that the measure is a three-factor structure: social information processing, social skills, and social awareness. The result of the confirmatory factor analysis revealed that all the observed variables were significantly represented by their latent variables. A good model fit was finally obtained as indicated in a relative chi-square test (x^2/df = 1.576), IFI = .968, TLI = .962, NFI = .917, CFI = .968, RMSEA = .058 (PCLOSE = .178), SRMR = .053. The explained variance ranged from 22.4% (social information processing) to 72.6% (social awareness). Internal consistency reliability of the social information processing, social awareness, and social skills factors yielded .94, .91, and .92 respectively. The average variance extracted (AVE) was also found to be .67, .66, and .65, indicating convergent validity. The square root of AVE was .82, .81, and .80, confirming the discriminant validity of the measurement model. The overall result of the study demonstrated that the Tromso social intelligence scale is reliable and valid enough to measure social intelligence among senior undergraduate students of Ethiopian public universities.

***Keywords*:** Tromso Social Intelligence Scale (TSIS), social intelligence validation, social intelligence Amharic version

Introduction

[1] Lecturer, Department of Psychology, Dire Dawa University. Email- dawitd344@gmail.com

[2] Associate Professor of Psychology, School of Psychology CEBS, AAU. Email tamirieand@yahoo.com

The rising curiosity in exploring new types of intelligence has resulted in discovering new and specific forms of intelligence, such as Cultural Intelligence (Earley & Ang, 2003), Practical Intelligence (Sternberg et al., 2000; Wagner & Sternberg, 1985), Emotional Intelligence (Bar-On, 2000; Mayer & Salovey, 1993), Fluid and Crystallized Intelligence (Cattell, 1987), and Social Intelligence (Thorndike & Stein, 1937, cited in Weis & SuB, 2005). Even though its inception dates back to the 1920s, social intelligence has recently become a relevant area of study that takes many researchers' attention (e.g., Boyatzis, 2009; Boyatzis, et al., 2014; Durlak et al., 2011; Honeywill, 2016; Zautra et al., 2015, 2016).

Social intelligence is viewed as a type of intelligence that refers to people's capacity to understand others and behave (or act) accordingly in relationships. A comprehensive description given by Moss and Hunt (1927, p.108, cited in Lacanlale, 2013) about it said "the ability to get along with others." Honeywell (2015) described social intelligence further as the capacity to navigate complex social relationships and environments.

Social intelligence plays a significant role in helping us understand the complexity and subtlety nature of both individual and group behavior. It is also an essential capacity to understand both implicit and explicit intentions of individuals and groups. With significantly low levels of social intelligence, it will be challenging for one to explore and find out the commonalities that are embedded in the society, and are governing the society he/she resides in as well. It is for that reason that some scholars (e.g., Habib, et al., 2013; Sternberg, 2004) described social intelligence as an individual's bank of knowledge towards the social matters of society. Indeed, group identities are social matters.

Individuals inherently need to adjust themselves with others in the groups they live in. However, establishing, developing, and maintaining social relations and meeting differences and/or conflicting views in a group is usually one of the challenges for many people in a society. Behaving appropriately in a group requires the ability to effectively manage personal and societal changes by developing realistic but flexible coping strategies. In this regard, individuals' level of social intelligence is assumed an important factor because it influences all sorts of our relationships with others.

In almost every aspect of interactions with others, one needs to utilize his/her abilities of understanding and managing others in his/her social environment. Lacanlale (2013) said:

> *Man needs to become adaptive and flexible in dealing with others to develop healthy and smooth relationships. He needs to develop and possess the capacity and ability to understand and manage other people. He needs to know how to operate and handle various situations, and he should have an idea about the social environment in which he is interacting. To respond to these needs, man's social intelligence is deemed to be important (p.263).*

A country converges with other countries on certain values and diverges on some others (Hofstede, 2001). As a result of the cultural divergence, it is assumed that the psychometric properties of the social intelligence scale and its factor structures are likely to vary. Most of the theories and foundational empirical evidence are American in character (e.g., George Washington Social Intelligence Test [GWSIT], Moss, et al., 1955; Structural Model of Human Intellect: Guilford, 1967; Multitrait-multimethod

[MTMM], Lee, et al., 2002) and are likely to be influenced by the Westerns, more particularly by the U.S. American set of values. Except for the MTMM, these measures of social intelligence also received additional criticism because they measure only the cognitive dimension of the construct, neglecting the behavioral aspect.

According to Hofstede (2001), the US values are characterized by high individualism, masculinity, low power distance, weak uncertainty avoidance, and short-term orientation. Ethiopia, in which this social intelligence scale was tested, is located in East Africa whose cultural values are characterized by collectivism, high power distance, low uncertainty avoidance, feminine, and short-term orientation (Hofstede, 2001). These differences among societies are considered relevant for differences between individuals because they influence even the most personal relations such as love, intimacy, marriage, and the break-up of relationships (Dumont, 1986). People are prone to social conditioning.

From these pieces of evidence, one can conclude that Ethiopia and individualist countries, for example, the US, converge on weak uncertainty avoidance and short-term orientation. Regardless of these convergences, however, Ethiopia and the US diverge on individualism-collectivism, masculinity-femininity, and high-power distance, low-power distance.

Therefore, as there are similar universality components and psychological meanings that human beings share because social psychological phenomena are universal across cultures (e.g., Norenzayan & Heine., 2005), there are also social behaviors that are likely to be different in proto-individualist, collectivist, and neo-individualist societies (e.g., Darwish & Huber, 2003) for different underlying factors such as values. Hence, these differences in values are likely to cause variations (1) in

the structure and organization of the social intelligence model, (2) people's prototype and ideal social intelligence, and (3) the pattern of relationships of the social intelligence factors with each other and with outcome variables. As part of a measure of one of the types of human intelligence, therefore, the TSIS constitutes these divergent and convergent elemental natures of human behavior across settings. Consequently, the study examined whether the TSIS items and factors share similar (a) factor structure (b) magnitude or strength of relationship, and (c) direction (pattern) of relationship with each other and with outcome variables on the data obtained from young public university students of Ethiopia.

Based on the aforementioned arguments about the current study and the general theoretical, conceptual, and empirical accounts presented in the Literature Review section (see below) of the social intelligence construct, the validation study aimed to meet the following specific objectives:

- Assess the relevance of the TSIS items of the Amharic language version.
- Examine the factor structure of the TSIS of the Amharic language version in a new setting.
- Investigate the pattern of relationships of the factors with each other in the Ethiopian context and validate the hypothesized model.
- Examine and determine the reliability and validity of the TSIS of the Amharic language version.

Literature Review

An overview of the general definitions of intelligence was given by Sternberg and Berg (1986) who presented the results of two symposia on intelligence that were held in the years 1921 and 1986. They stated that, in these symposia, the main protagonists of intelligence research were asked. In the second symposium, for example, answers were manifold and ranged from intelligence is "what is valued by culture" to "speed of mental processing" with a maximum agreement for the definition of "higher level components of abstract reasoning, representation, problem-solving, decision making" (p. 158).

In both symposia, as Sternberg and Berg (1986) revealed, there was interest in the extension of existing intelligence concepts. The real-life manifestations of intelligence were of interest to the participants. Furthermore, the extension of intelligence has been the topic of large amounts of diversely oriented efforts, among them the convention of reputable experts in intelligence research for a symposium on the 3rd International Spearman Seminar, held at Sydney, in the year 2001, on The Enhancement of Intelligence. The contributions at this symposium reflected the diversity of extensions to intelligence concepts ranging from reductionist approaches to a "trend of diversification" (Weis & SuB, 2005, p. 109). At the other end of the spectrum, the introduction of a new ability construct represents an attempt to diversify the field of human intelligence.

When Edward Thorndike first proposed social intelligence in 1920, his goal was to go beyond conventional notions of intelligence. Compared to academic intelligence, the operationalizations of social intelligence contained additional or distinct criteria than just cognitive requirements. The diversity of approaches resulted in limited progress in establishing social intelligence as a meaningful and unitary

factor of human abilities. Moreover, the unsystematic use of definitions and measurement concepts resulted in legitimate skepticism of some authors (e.g., Ford, 1994) about whether to specify social intelligence as a performance or ability construct. Consequently, scholars began examining the relations between social intelligence and other comparative concepts such as competence, performance, abilities and skills, etc. These concepts are presented comparatively with social intelligence hereunder.

The expressions intelligence and competence, for instance, were often applied as synonyms in social intelligence research. SuB et al. (2005b, cited in Weis & SuB, 2005), for example, have identified important distinctions between these two concepts. According to them, competence is specific to different situations and contexts (i.e., in certain applied settings) and more subject to modification and learning than intelligence. Intelligence is comparatively stable over time and seen as hereditary to a substantial extent (Grigorenko, 2000). Thus, social competence can be classified as a socially constructed concept, as it comprises all person-related preconditions to show successful behavior in varying types of applied settings. Moreover, definitions of social competence would vary substantially according to the spectrum of covered human attributes from just one (e.g., management of conflict, communication skills) to a complex interaction of various variables (Weis & SuB, 2005). However, it is pointed out that social intelligence often is a necessary part of competence concepts.

Performance is another concept that is often seen as synonymous with social intelligence. According to Weis and SuB (2005), however, performance indicates the finally expressed behavior (the result) in contrast to the person-related preconditions that "only" enable behavior (the potential). Whether a person is capable of showing

successful or effective behavior is not a direct function of this person's potential (i.e., competence and intelligence) and additionally, it is dependent on certain personality traits (e.g., shyness, altruism, etc.), from moods and current psychological states (e.g., fear, exhaustion), and context variables (e.g., group values), as the authors state. They further elaborate that the distinction between competence and performance is not only theoretical, it is also apparent when distinguishing between potential- and results-oriented approaches used to assess social competence. Contrary to the potential-oriented approaches, results-oriented approaches conceive social competence as effective behavior (the outcome) where effectiveness is determined through the specific properties of the situation.

Last but not least is the distinction between social intelligence and abilities and Skills. Intelligence constructs usually consist of several distinguishable ability factors, for example, reasoning or verbal abilities. Competence constructs also contain cognitive and behavioral skills. According to Scherer (2007), however, abilities represent more general, dispositional capacities. They are "either genetically endowed or acquired over a long period of socialization" (p. 103). Contrarily, skills are, according to Scherer (2007), concrete actions or applications of cognitive operations on concretely defined problems (e.g., driving with a stick shift or applying an algorithm on some new data). Also, skills are acquired in a process of several steps and are finally characterized by an automated series of actions (Ackerman, 1987).

Social intelligence, therefore, includes one or more of the following key components: the ability to recognize, understand, and express emotions and feelings; the ability to understand how others feel and relate with them; the ability to manage and control emotions; the ability to manage change, adapt and solve problems of a

personal and interpersonal nature; and the ability to generate positive affect and be self-motivated (Bar-On, 2000).

Studies on young students have shown the importance of social intelligence for adolescents and young students in their lives. Given the fact that it is very important for their network, affecting positively their day-to-day interactions and future developments (e.g., Laird et al., 2001), there is also a consensus that adolescents with better social intelligence can solve many societal problems and problems related to relationships (e.g., Dodge & Pettit, 2003). Students at the university level will be able to establish new relationships, create additional networks, and maintain their existing ones (Robert, et al., 2013) provided that they are socially intelligent. Also, students with high social intelligence are good at resolving relationship problems when they exist and can manage them smoothly.

According to Davis (2010), social intelligence is one important factor to improve the development of adolescents and their future careers. Those with high social intelligence can be self-motivated to achieve their goals. They are supportive and consistent in their behavior, and also strive to establish new relations for their goals. Hopkins and Bilimoria (2008) also found that social intelligence helps develop and maintain positive relationships and manage disputes among students in a learning environment. It also helps students perform better in their later life out of the academic environment too. Social intelligence is one key factor in solving societal and relational problems. In a country, like Ethiopia, where almost all public universities continue to experience conflicts, and clashes, including brutal killings among students, examining the problem remains vital.

Materials and Methods

Study Design

The study was a non-experimental research, in which a cross-sectional design was employed. We aimed to validate the psychometric properties of social intelligence measures by utilizing the data obtained from young public university students. It employed a quantitative research method to meet its objectives.

Study Participants, Sample Size, and Sampling Procedures

Because social intelligence is assumed to be built up over time through interactions and exposures, the participants we opted for in the current study were senior students who stayed at Dire Dawa University (DDU) and Wollo University (WU) for three years and above. To select these universities, factors related to resource utilization and practicality details, including accessibility, affordability, safety and security matters during trip and data collection were considered. The assumption behind targeting year three and above students was it would help decrease ambiguities related to students' limited exposure and culture-bounded experience concerns, which are taken as the most important issues in understanding the construct. To avoid significant variations among participants in terms of experience and exposure and subsequently to tackle the potential problems associated with inflated gaps in these attributes, we did not include graduate, postgraduate, or non-regular students.

To draw the sample, Yamane's (1967) sample size formula and stratified proportional sample size formula were respectively used, taking the size of the population of the two strata (DDU & WU) as the general population. Thus, the sample size calculation was done based on the formula:

$$n = \frac{N}{1 + N(e)^2}$$

Where,

n is the sample size; *N* is the population size; *e* is the level of precision.

The assumption is that at a 95% confidence level, $p = .05$. The size of the population was 11,359. Thus,

$$n = \frac{11{,}359}{1 + 11{,}359 * 0.05^2}$$

$$\frac{386}{}$$

It is commonly suggested by authors that in proportional stratified random sampling, the sample for each stratum should be proportional to the size of the subpopulation in each stratum. Accordingly, to have a proportional allocation of the sample of participants, the sample size for each stratum was computed by:

$$nk = \frac{Nk * n}{N}$$

Where,

nk is the sample size in each stratum*; Nk* is the size of the sub-population in stratum *k*; *N* is the total population; and *n* is the sample size for the population.

The two universities' population was ((DDU = 6,737) + (WU = 4,622) = 11,359). With a nonresponse rate of 5% (19 + 386 = 405), the sample taken was:

$$\text{DDU} = n_{DU} = \frac{Nk * n}{N} = \frac{6{,}737 * 386}{11{,}359} = 228$$

$$\text{WU} = n_{WU} = \frac{Nk * n}{N} = \frac{4{,}622 * 386}{11{,}359} = 158$$

A total of 405 participants (239 from DDU and 166 from WU) were drawn. From the equivalent number of distributed questionnaires, 348 were

appropriately filled in and returned, while the rest 57 (32 from DDU & 25 from WU) were either not returned or not properly filled in. Three participants were found to be non-Ethiopian and were excluded from the analyses. The validation study was, therefore, initially conducted on a sample of 345 students. This indicates that 85% of the questionnaire was returned, which is considered an excellent rate of response.

By using the specific lottery technique of the random sampling method, we drew the sample from fourth-year students of Psychiatry Nursing, fifth-year students of Electrical Engineering and Architecture, third-year students of Civics Education and Journalism, fourth-year students of Midwifery, and third-year students of Accounting for the 2021/22 academic year at DDU and WU. The data collection was carried out in April and June 2022, with the participants' consent obtained.

Data Collection Procedures

The validation study in general was carried out with different stages, including doing a vast review of related literature initially, developing a plan of action of activities, deciding on the research setting and the target population, dealing with the tool adaptation, translating, and validating, determining sample size and sampling strategies, collecting data and analyzing it, reporting the results and discussing them, and preparing the manuscript for publication.

After going through rigorous adaptation, translation, and content validity assessment (see Instrument Adaptation, Translation and Content Assessment Processes section below), the instrument was finally made ready for data collection. Before leaving Addis Ababa, we held support letters from AAU and sent a copy of each to the already contacted assistant data collectors in advance to fix issues such as gaining access to the study sites, obtaining students' lists from the registrar office or

departments, and scheduling the dates of data collection beforehand. We also obtained an ethical clearance letter from the ethics committee of the School of Psychology.

The data collection task was done by the main researcher and a total of five assistant data collectors at both sites. A general introduction about the aim of the study and instructions on the instrument was given to participants at the beginning of each data collection session. To give protection and assurance for any potential threats, participants were told to generate a three-digit code in a comprehensive rule set by the research team and to write it down on a blank space provided to it. It was planned to use the code given by the participants later on in the coding process as well for a complete and uniform data set. However, the codes given by the participants were not found suitable (for example, the same code was generated by different participants), so we gave a new code at the end.

The data collection was conducted in group sessions, consisting of 20 to 30 participants in a classroom for better administration and maximizing the possibility of getting properly filled-in questionnaires back.

Ethical Considerations

Priority attention was given to ethical issues. We strictly followed and respected the principle of informed consent. We told participants to withdraw if they wanted to leave the study at any time. We gave assurance of protection of confidentiality to the participants and tried to avoid any potential threats that could be caused by being participants as much as possible. Techniques such as keeping the participants anonymous, employing pseudonyms (generated codes), and keeping the data obtained confidential and secure were some of the methods employed to assure safety. Furthermore, we gave attention not to intrude into participants' personal life

issues and any intention of pressuring them to give responses for the mere sake of obtaining information.

Psychometric Properties of the TSIS

The Tromso Social Intelligence Scale (TSIS) self-evaluation measure, which is a multi-faceted social intelligence measure, was developed and validated by Silvera et al. (2001). The TSIS is a 7-point scale degree of agreement ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The higher the score, the higher the level of social intelligence. It consists of 21 items and measures the three social intelligence dimensions– Social Information Processing (SIP), Social Skills (SSs), and Social Awareness (SA) – each of which utilizes seven items. The 21-item measure has been translated into different languages in many countries, subject to validation tests, and its psychometric qualities have been found to range from adequate to excellent (e.g., Dorgan & Cetin, 2009; Gini, 2006; Grieve & Mahar, 2013; Park et al., 2019).

Consequent studies have supported the psychometrics, factor structure validity, and generalizability of the TSIS. The three-factor structure was replicated across multinational samples (e.g., Chater, et al., 2023; Dorgan & Cetin, 2009; Frankovsky & Birkner, 2014; Kyoung et al., 2019). Across studies, the TSIS showed good internal consistency reliability, and acceptable model fit.

To the best of our knowledge, however, the TSIS has not been yet translated into Amharic, systematically examined, and validated for the Amharic-speaking population of Ethiopia, which is estimated to take the highest portion of the population.

Instrument Adaptation, Translation and Content Assessment Processes

We used the Adapted Amharic version of the Tromso Social Intelligence Scale (TSIS). As the data collection instrument was fully pencil-and-paper based, three

main phases (i.e., adaptation, translation and content validity assessment) were carried out to ensure reliability and validity.

The researchers first did the initial adaptation work in light of intelligence theories in general and in the triarchic theory of intelligence in particular. We then gave the instrument to psychology experts for a more robust cross-adaptation and customization purpose to the Ethiopian context. The experts were PhD holders and a few PhD candidates. Definitions of the construct with its dimensions were presented to them. Translation of the adapted measure, which was originally in English as the original measure, into the Amharic language was done. We used bilingual linguistics experts for this particular task. The translation task was carried out before we exposed the instrument to content validity assessment.

The Amharic version of the TSIS, which consisted of 21 items, was then presented to the psychology experts for content validity assessment. The raters were Psychology experts who were bilingual too. They were asked to rate each item on the scale as "Essential", "Useful but not Essential" and "Nonessential." There were no items rated as "nonessential" by them. Nonetheless, there were items rated by the experts as "useful but not essential." We modified these items based on the experts' comments. These specific items were again inspected by one of the language experts for language appropriateness.

We finally employed Lawshe's (1975) content validity ratio formula (CVR) and interpretation to quantify and find out the consensus of the experts. To determine the retention of an item based on its CVR, cut-off values are given. Consequently, the CVR for each item of the measure was found to range from .75 to 1. The Content Validity Index (CVI) of the items on the scale was .95.

Data Analyses

We utilized IBM SPSS version 25 and AMOS 23 software for the statistical analyses. We used descriptive statistics to show basic information regarding the variables. Histogram and Boxplot were used to inspect and find out outlying cases. We employed exploratory factor analysis (EFA) to inspect the factors that underlie the set of items of the social intelligence measure. We applied Oblique rotation because the factors have been theoretically assumed to correlate with each other. Kaiser criterion of extraction of components (i.e., factors with eigenvalues of ≥ 1) was used to determine the number of factors to be retained. To further inspect the number of factors visually, we also used a scree plot.

We employed confirmatory factor analysis (CFA) to investigate and understand the relationship between observed and unobserved variables. We also checked model fitness. The data set was split into two to conduct the EFA and CFA on separate and independent data. We also employed a multiple imputation method to statistically deal with some of the missing values.

Results

Outliers and Missing Values

Before conducting the multivariate analysis, we did data screening and assumption checking mainly. Consequently, we found some outlying cases and missing values at the preliminary stage of the analysis. By inspecting the Histogram and Boxplot, a few data points were found to be outliers (i.e., Code DDU134, DDU198, DDU200, DDU111, DDU202, WU329 & DDU199) on the social intelligence scale. The values of these data points were not considered as they could seriously affect the multivariate analysis and lead to errant data outcomes. The

descriptive statistics result (Table 1) shows that these cases would not have a significant influence on the analysis. The difference between the variables' *Mean* and their *5% Trimmed Mean* cannot be considered as a significantly large amount of variation. This result implies that these outlying cases were not too far from the rest distribution. Therefore, we maintained them in the data set for the analysis.

In the preliminary analysis stage, we also found cases that missed a few items of the measure. However, they were below 5% in terms of item-wise analysis. We statistically manipulated by employing multiple imputation methods on these cases for the multivariate analysis. However, two cases (Code DDU147 & DDU187) that were found with many more missing items (57.14% & 47.61%) respectively from the overall social intelligence scale were removed from the data set. Consequently, the study was conducted on a sample of 343 participants.

Descriptive

A summary of the descriptive information of the social intelligence construct is presented in Table 1 below. For example, for the SIP dimension of social intelligence, we obtained the data from 343 participants, with values ranging scores from 8 to 49, (M = 37.65, SD = 7.81). Likewise, for the SSs and SA dimensions, we found the data from 343 respondents, ranging from 6 to 42 with a mean of 31.03, SD = 7.52, and a mean of 31.22, SD = 6.73 respectively. The scores ranged from 20 to 132, (M = 99.89, SD = 16.64).

The mean age of the participants was 22.05 (SD = 1.30). Twenty-six participants did not state their age. Two hundred thirty-seven (69%) were male, and 105 (31%) participants were female. One participant did not specify his or her sex. Regarding the original area of residence where participants had come from, 133

(38.8%) were from rural and 194 (56.6%) were from urban areas of Ethiopia. Sixteen participants did not respond to the question about their area of residence.

Concerning the family socioeconomic background of students, it was revealed that 35 (10.2%), 56 (16.3%), and 246 (7.7%) participants were from high, low, and medium socioeconomic backgrounds respectively. Six participants did not state about their family socioeconomic status. This descriptive information in percentage was calculated after the two cases, which were found missing cases with 12 and 10 items respectively, were discarded from the data set at the initial stage.

Table 1

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
Age	317	20	26	22.05	1.30	.445	-.192
SIP	343	8	49	37.65	7.81	-.946	.913
SSs	343	6	42	31.03	7.52	-.908	.758
SA	343	6	42	31.22	6.73	-.659	-.077
Overall Social Intelligence	343	20	132	99.89	16.64	-.958	1.450

SIP = social information processing; SSs = social skills; SA = social awareness. 5% Trimmed Mean of SIP = 38.16; SSs = 31.53; SA = 31.52; overall social intelligence = 102.

Table 1 depicts the distribution of the data, presenting the 5% trimmed mean, skewness, and kurtosis values. The difference between the mean and the trimmed mean of each of the social intelligence dimensions was not large.

Hair et al. (2010) pointed out that skewness between -2 to +2 and kurtosis between -7 to +7 of a data set is considered normally distributed. Curran et al. (1996)

suggested normality thresholds of 2.0 and 7.0 for skewness and kurtosis respectively when assessing multivariate normality such as factor analyses and MANOVA.

Exploratory Factor Analysis Result

We employed exploratory factor analysis to examine the pattern of the newly adapted and translated items and to test the stability of the factor structure from sample to sample and to validate prior studies' results. Before running the exploratory factor analysis, we checked the sample size, correlational strength of the items, linearity, and the presence of significant outliers to know the appropriateness of the data for the analysis. Two items were found poorly functioning items. Before these items were removed, the KMO value was .868 and Bartlett's Test of Sphericity was $p < .05$. When the items were deleted, the KMO value reached .869 with the Bartlett's Test of Sphericity at $p < .05$. According to the KMO model, values less than 0.6 show the sample is not likely sufficient and other remedial actions are required. If the KMO value is less than 0.5, the data undoubtedly won't be very suitable for factor analysis (Shrestha, 2021). The significant value < .05 indicates that the set is very suitable for the analysis. Therefore, the results in the present study indicated that the data set was appropriate for the exploratory factors analysis.

We inspected the correlation coefficient matrices before and after the poor items were removed (see Table 2 & Table 3). The result of the inspection of the correlation coefficients matrix, after the poor items were deleted, revealed that the majority of correlation coefficients were greater than .2 in the scale and greater than .5 in their respective factors (see Table 3).

We used Kaiser's criterion to retain factors that could be extracted for additional securitization. Consequently, factors that had an eigenvalue of ≥ 1 were

maintained. We also used a scree plot to depict the shape of the plot visually along with Kaiser's criterion. The result of the scree plot revealed that the slope of the curve was levelled off between the third and fourth factors, showing first three factors explained more of the variances than all the rest factors (see Figure 1).

Table 2

Correlation Matrix of the Social Intelligence Scale Before Poor Items Discarded

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1. SIP1	-																				
2. SIP2	.70**	-																			
3. SIP3	.80**	.71**	-																		
4. SIP4	.69**	.67**	.72**	-																	
5. SIP5	.73**	.66**	.75**	.80**	-																
6. SIP6	.65**	.66**	.63**	.74**	.76**	-															
7. SIP7	.62**	.61**	.67**	.672**	.74**	.81**	-														
8. SS1	.17*	.07	.22**	.19*	.21**	.14	.25**	-													
9. SS2	.19*	.08	.22**	.21**	.19*	.15	.22**	.70**	-												
10. SS3	.30**	.22**	.30**	.27**	.31**	.25**	.28**	.63**	.65**	-											
11. SS4	-.13	-.12	-.12	-.21**	-.13	-.16*	-.18*	-.38**	-.29**	-.31**	-										
12. SS5	.19*	.06	.16*	.24**	.20*	.14	.13	.57**	.54**	.63**	-.34**	-									
13. SS6	.31**	.18*	.32**	.36**	.33**	.23**	.29**	.55**	.70**	.65**	-.29**	.68**	-								
14. SS7	.26**	.10	.29**	.24**	.26**	.20*	.21**	.60**	.55**	.55**	-.33**	.66**	.72**	-							
15. SA1	.16*	.04	.17*	.16*	.19*	.13	.22**	.22**	.15	.20*	-.04	.22**	.24**	.25**	-						
16. SA2	.14	.12	.20*	.15*	.16*	.16*	.17*	.27**	.20**	.30**	-.06	.32**	.27**	.25**	.65**	-					
17. SA3	.10	.07	.20**	.10	.14	.15	.14	.28**	.17*	.32**	-.05	.32**	.28**	.30**	.59**	.66**	-				
18. SA4	.04	.01	.09	.04	.08	.06	.08	.12	.07	.13	.05	.20	.10	.12	.56**	.55**	.58**	-			
19. SA5	.01	-.03	.04	.04	.06	.04	.12	.30**	.09	.20**	-.03	.29**	.17*	.26**	.59**	.62**	.63**	.52**	-		
20. SA6	.13	.082	.13	.10	.13	.13	.16*	.24**	.14	.25**	-.02	.24**	.21**	.22**	.57**	.77**	.59**	.61**	.61**	-	
21. SA7	-.07	-.16*	-.06	-.10	-.08	-.06	-.05	-.16*	-.02	-.12	.18*	-.20*	-.14	-.25**	-.21**	-.13	-.17*	-.15	-.26**	-.09	-

**Correlation is significant at the 0.01 level (2-tailed); *Correlation is significant at the 0.05 level (2-tailed); SIP = social information processing; SSs = social skills; SA = social awareness.

Table 3

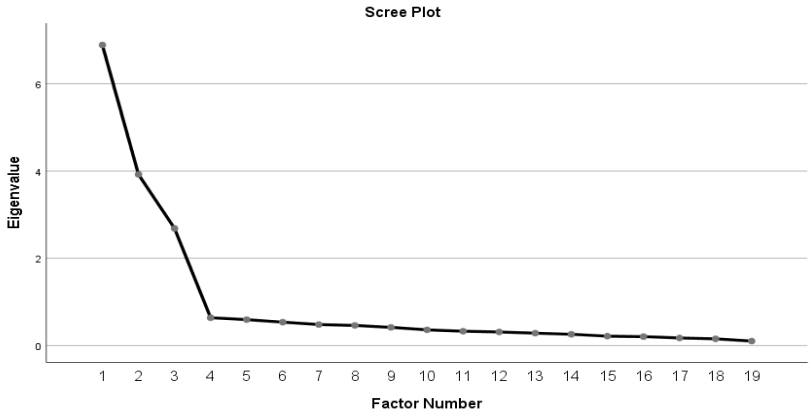
Correlation Matrix of the Social Intelligence Scale After Poor Items Discarded

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. SIP1	-																		
2. SIP2	.70**	-																	
3. SIP3	.80**	.71**	-																
4. SIP4	.69**	.67**	.72**	-															
5. SIP5	.73**	.66**	.75**	.80**	-														
6. SIP6	.65**	.66**	.63**	.74**	.76**	-													
7. SIP7	.62**	.61**	.67**	.67**	.74**	.81**	-												
8. SS1	.17*	.07	.21**	.19*	.21**	.14	.25**	-											
9. SS2	.19*	.08	.22**	.21**	.19*	.15	.22**	.70**	-										
10. SS3	.30**	.22**	.30**	.27**	.31**	.25**	.28**	.63**	.65**	-									
11. SS5	.19*	.06	.19*	.24**	.20*	.14	.13	.57**	.54**	.63**	-								
12. SS6	.31**	.18*	.32**	.36**	.33**	.23**	.29**	.55**	.70**	.65**	.68**	-							
13. SS7	.26**	.10	.29**	.24**	.26**	.20*	.21**	.60**	.55**	.55**	.66**	.72**	-						
14. SA1	.16*	.04	.17*	.16*	.19*	.13	.22**	.22**	.15	.20*	.22**	.24**	.25**	-					
15. SA2	.14	.12	.20*	.15*	.17*	.16*	.17*	.27**	.20**	.30**	.32**	.27**	.25**	.65**	-				
16. SA3	.10	.07	.20**	.10	.14	.15	.14	.28**	.17*	.32**	.32**	.28**	.30**	.59**	.66**	-			
17. SA4	.04	.01	.09	.04	.08	.06	.08	.12	.07	.13	.10	.10	.12	.56**	.55**	.58**	-		
18. SA5	.01	-.03	.04	.04	.06	.04	.12	.30**	.09	.20**	.29**	.17*	.26**	.59**	.62**	.63**	.53**	-	
19. SA6	.13	.08	.13	.10	.13	.13	.16*	.25**	.14	.25**	.24**	.21**	.22**	.57**	.77**	.59**	.61**	.61**	-

** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed); SIP = social information processing; SSs = social skills; SA = social awareness.

Figure 1

Scree plot Depicting Factors of the Social Intelligence Measure based on Eigenvalues



In the first step of the exploratory factor analysis, two items in the social skills and social awareness subscales (SS4 & SA7) were found to be poorly loading items. They did not show acceptable values, revealing the items were not good enough to fit with the rest items in their respective factors. They yielded the lowest commonality values: *SS4* (.190) and *SA7* (.055). We removed these items, and thus, the total variance explained increased from 62.515% to 65.531%. Significant differences in the factor loading values of the other items were also shown (see Table 4).

After discarding those poorly functioning items, the result of the exploratory factor analysis showed considerable change and progress with strong loadings of items. The result revealed the presence of three factors on the social intelligence scale with eigenvalues exceeding 1. The three-factor solution explained a total of 65.531% of the variance, comprising 34.062%, 19.254%, and 12.215% of the variances respectively. The rotated solution showed that all individual items of the measure significantly loaded on all factors. That is, the SIP items were strongly loaded on

factor 1, the SSs items were strongly loaded on factor 2 and the SA items were strongly loaded on factor 3. The rotation result yielded that there were no poorly loaded items in each factor. There were no cross-loadings either (see Table 4).

Table 4

Factor Loadings of the Rotated Three-factor Measure for the Social Intelligence Scale

	Factor			Commonalities
	1	***2***	***3***	
I can often understand what others are trying to accomplish without the need for them to say anything	.890			.794
I understand others' wishes	.858			.739
I understand other people's feelings	.847			.721
I can predict how others will react to my behavior	.843			.714
I can predict other people's behavior	.828			.687
I can often understand what others mean through their expressions, body language, etc	.817			.671
I know how my actions will make others feel	.789			.637
I have no difficulties to fit in easily in social situations mostly		.852		.732
I know how to exhibit respect for others in different social situations		.792		.641
I am good at entering new situations and meeting people for the first time		.782		.617
I have no problems getting along with other people mostly		.782		.612
It doesn't take me a very long time to get to know others well mostly		.779		.614
I am good at getting on good terms with new people		.755		.563
People are mostly comfortable with me when I say what I think			.861	.745
I realize it when I offend others or make them feel bad			.827	.684
I am always mindful of my actions thinking seriously about others' reactions towards what I do			.779	.613
I am not very surprised with the things people from a different or similar background			.760	.585
I often feel that it is not very difficult to understand others' choices			.748	.563
I can identify predictable and unpredictable people and treat them and/or act accordingly			.704	.509

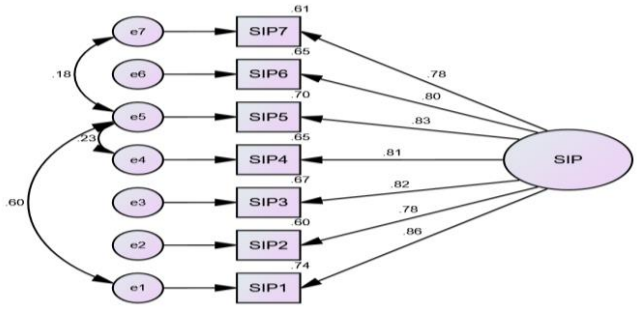
Confirmatory Factor Analysis Result

To examine the relationship between observed factors and latent variables, we conducted a confirmatory factor analysis next to the exploratory factor analysis. As pointed out before, the data set was first split into two. Consequently, the confirmatory factor analysis was conducted on the second cluster of the data set that comprised 173 sample participants. By using a unidimensional CFA test first, observed items (indicators) for each variable with its metric value were identified.

To determine whether the adapted measurement model could fit the present data or not, we used the combination of the various fit indices types such as the relative chi-square test (x^2/df), Incremental Fit Index (IFI), the Tucker-Lewis Index (TLI), the Bentler-Bonett Normed Fit Index (NFI), the Bentler's Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). In this regard, Hu and Bentler (1999), for example, suggested that it is important to use the combination of one of the different types of fit indices such as absolute fit indices, relative (or comparative) fit indices, parsimony fit indices, and those based on the noncentrality-based parameter to minimize Type I and Type II errors under various conditions.

Figure 2

First-Order Measurement Model for Social Information Processing



The social information processing (SIP) variable constituted seven items. Based on the modification indices recommendations, the covariance of error terms was required. Accordingly, the correlation of error terms between item 1 and item 5 (e1 & e5), items 4 and 5 (e4 & e5), and items 5 and 7 (e5 & e7) was done (see Figure 2). Subsequently, the model yielded a relative chi-square test (x^2/df = 1.729), IFI = .992, TLI = .984, NFI = .981, CFI = .992, RMSEA = .065 (PCLOSE = .271), SRMR = .021. The standard regression weight ranged from .781 (SIP7) to .858 (SIP1).

Figure 3

First-Order Measurement Model for Social Skills

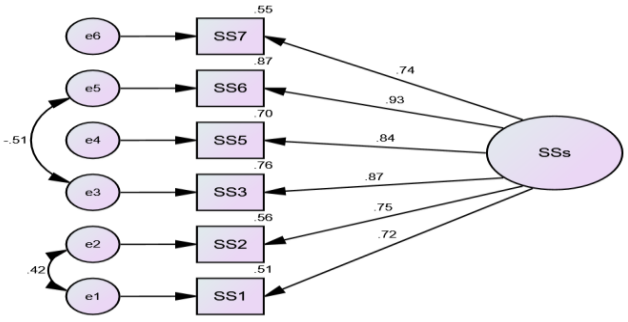
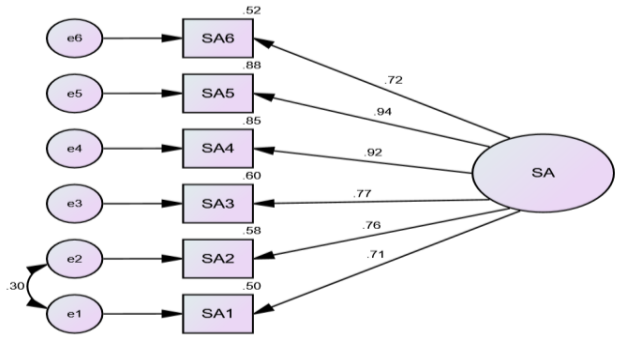


Figure 3 presents the social skills (SSs) measurement model that comprises six items. To improve the model, a correlation of error terms for this measurement model was needed. After a correlation of error terms between item 1 and item 2 (e1 & e2) and item 3 and 6 (e3 & e5), it was found that that a relative chi-square test (x^2/df = 1.237), IFI = .998, TLI = .995, NFI = .988, CFI = .998, RMSEA = .037 (PCLOSE = .544), SRMR = .019. The standard regression weight ranged from .717 (SS1) to .931(SS6).

Figure 4

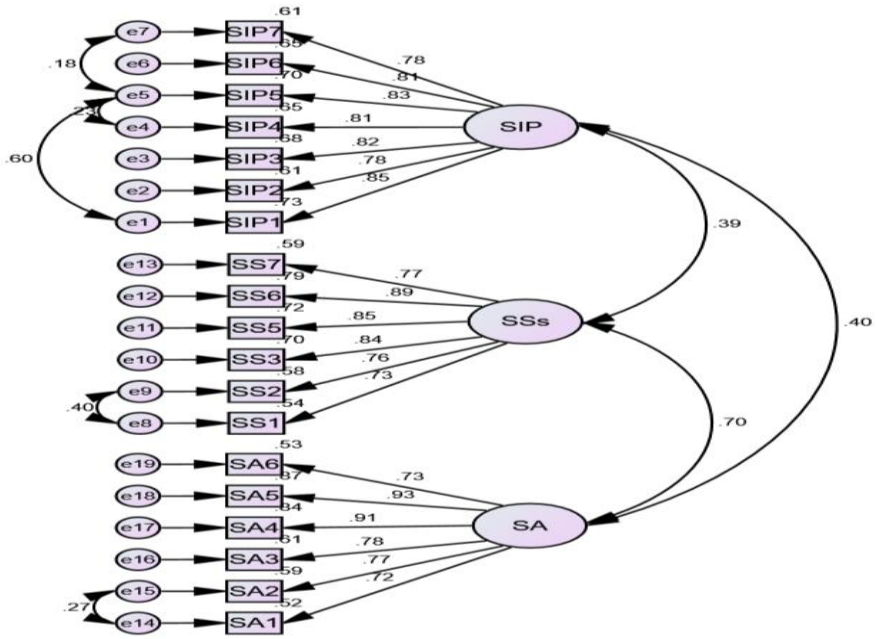
First-Order Measurement Model for Social Awareness



The first-order measurement model for social awareness (SA) had six items. For a better model fit, a correlation of error terms between item 1 and item 2 (e1 & e2) based on the modification indices suggested by AMOS 23 was conducted. Consequently, it was found out a relative chi-square test (x^2/df = 1.458), IFI = .995, TLI = .991, NFI = .985, CFI = .995, RMSEA = .052 (PCLOSE = .424), SRMR = .036. The standard regression weight was found to range from .709 (SA1) to .938 (SA5).

Figure 5

First-Order Three-factor Social Intelligence Measurement Model



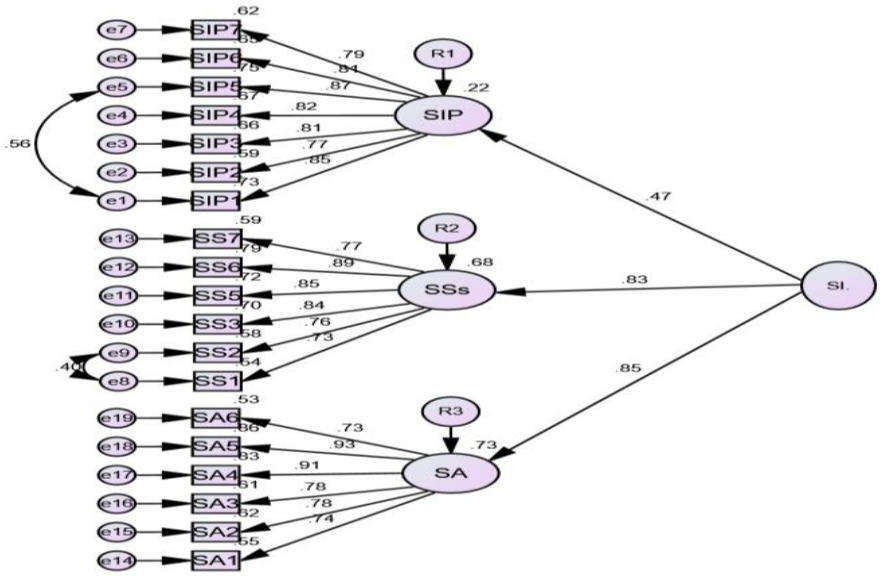
The result of the confirmatory factor analysis of the first-order three-factor model for the social intelligence scale was the same as the first-order results of the factors (see Figure 5). It yielded values that indicated an excellent model fit; a relative chi-square test (x^2/df = 1.430), IFI = .977, TLI = .972, NFI = .926, CFI = .976, RMSEA = .050 (PCLOSE = .486), SRMR = .054. Figure 5 presents some of the details of the result of the CFA such as the standardized regression weights, correlation of the latent factors, the squared multiple correlation coefficients, and the covariance of error terms of the final measurement model.

The final structural measurement model for social intelligence was found with (x^2/df = 1.576), IFI = .968, TLI = .962, NFI = .917, CFI = .968, RMSEA = .058

(PCLOSE = .178), SRMR = .053. The error covariances in the first- and second-order model examinations were not observed (see Figure 6).

Figure 6

Second-Order Structural Measurement Model for Social Intelligence



Construct Reliability and Validity

Because a construct's reliability and validity can be calculated and determined by referencing some of the values in the confirmatory factor analysis result, we calculated and used the Composite Reliability (CR) and the Average Variance Extracted (AVE) for the purposes. Besides the internal consistency reliability measured by Cronbach's alpha, we conducted a composite reliability (CR) analysis to examine the reliability of the scale. Consequently, the CR of SIP, SA, and SSs were found .93, .92, and .92 respectively. Composite reliability is a vital technique to assess

the reliability of factor measurement, applying the same criteria of cutoffs for adequate reliability coefficients.

We examined convergent validity to assess the degree to which all items of the social intelligence measure measured the same underlying construct they were supposed to measure. The Average Variance Extracted (AVE) is one of the criteria to know the convergent validity of a construct. The AVE of the SIP, SA, and SSs constructs were found .67, .66, and .65 respectively, which showed convergent validity and exhibited the occurrence of correlation between observed factors within each latent variable. The average extracted standards should be greater than .50 to show the presence of convergent validity (Hair et al., 2019).

To examine and know the extent to which the variables correlated to their factor than to another factor, we examined the discriminant validity of the measure. Among the various methods used to assess discriminant validity, AVE is one of those methods widely used to examine. The square root of the values of the AVE of the latent variables (SIP, SA & SSs) were .82, .81, and .80 respectively, which, in turn, is greater than the correlation between them (i.e., .40, .39 & .70), confirming the discriminant validity of the measurement model. Table 5 depicts details of the reliability and validity of the measure.

Table 5

Reliability and Validity of the Social Intelligence Scale

	Construct		
	SIP	*SA*	*SSs*
Cronbach's alpha	.94	.91	.92
CR	.93	.92	.92
AVE	.67	.66	.65
Number of Items	7	6	6

CR = composite reliability; AVE = average variance explained; SIP = social information processing; SA = social awareness; SSs = social skills.

Discussion

The study used the TSIS, which has become one of the most frequently used instruments in several recent social intelligence studies, by adapting to the Ethiopian context and translating it into the Amharic language version. Out of the 21 items the original scale constituted, the 19 items were found relevant and appropriate (culture universal) to measure the social intelligence construct in the Ethiopian context of the Amharic language-speaking students. The two items that were limited to the original measurement model but that lacked practical relevance or similarity in psychological meaning to the context of the present study were deleted.

The majority of correlation coefficients of retained items in their respective factor were found to be greater than .5, which is large. In this regard, different authors suggest different interpretations. Cohen (1988, p. 79-81), for example, suggested small (r =.10 to .29), medium (r =.30 to .49), and large (r =.50 to 1.0).

We employed an exploratory factor analysis (EFA) by applying the maximum likelihood extraction method with Promax rotation. The result of the EFA showed that social intelligence is a three-factor construct, comprising social information processing, social skill, and social awareness dimensions. This result is consistent with prior studies on the measure (e.g., Chater et al., 2023; Dorgan & Cetin, 2009; Frankovsky & Birkner, 2014). The multidimensional nature of the social intelligence construct had more empirical support from studies that used self-report methods of social intelligence (e.g., Brown & Anthony, 1990; Kriemeen & Hajaia, 2017; Marlowe, 1986), revealing similar results. Therefore, the factor structure of the Amharic language version of TSIS was checked and found invariant in a new setting in the present study.

Following the EFA, we conducted a confirmatory factor analysis (CFA) to examine the model fit of the data by employing the maximum likelihood estimation method and the combination of the different types of fit indices to determine model fit. An overlap between a few items was found. A correlation of error terms between these items in their respective factors was conducted based on the modification indices suggested by AMOS 23 software to obtain a good model fit.

Consequently, the loadings of the standardized regression weight for the 19 items ranged from .724 (social awareness item 1) to .933 (social awareness item 5). All the correlations among the latent and observed variables were significant ($p < .05$) and all the loadings were greater than .7. Using the rules of thumb (Tabachnick & Fidell, 2007), all the factor loadings were considered fair to excellent, and all indicator variables significantly loaded on the expected latent variable. The variance explained by the observed variables (R^2) ranged from .525 (social awareness item 1) to .870 (social awareness item 5). In other words, the explained variance ranged from 52.5% to 87% while the unexplained variance or residual was from 47.5% to 13% respectively. Items that explained the lowest and highest variances were found in the social awareness factor. It is important to note here that the items in the social information processing and social skill factors explained variances under this range. This means the relevance and appropriateness of the 19 items to the Ethiopian context was confirmed. Similarly, in a study conducted by Kyoung et al. (2019) to validate the TSIS to the Korean Version, for example, four items were not found appropriate to their context. Measuring psychological constructs across different populations requires that the instrument's reliably and validly capture the construct of interest within each separate population (Fischer, & Smith, 2021).

In terms of factor-wise contribution, the standardized regression weight for the three-factor structure of social information processing, social skills, and social awareness was found .473, .826, and .852 respectively. The variance explained by the observed variables (R^2) for social information processing, social skills, and social awareness was found .224 (22.4%), .683 (68.3%), and .726 (72.6%) respectively in the model. This is in an acceptable range for social science. An R-squared that is between 0.10 and 0.50 is acceptable provided that some or most of the explanatory variables are statistically significant, and between 0.50 and 0.99 is acceptable when most of the explanatory variables are statistically significant in social science. The only caution to the latter is that the high R squared should not be caused by multicollinearity among the explanatory variables (Ozili, 2023).

The correlation between the latent factors was found r = .39 (between social information processing & social skill), r = .40 (between social information processing and social awareness), and r = .70 (between social skills and social awareness). All the correlations among the latent factors were statistically significant (p < .05). This implies that the strength of the relationships of the TSIS factors of the Amharic language version was found good enough.

To sum up, the study finally revealed that all items of the Amharic language version of the TSIS were found measuring the same underlying construct they were supposed to measure, indicating convergent validity, and the items correlated to their factor than to another factor, showing discriminant validity of the measure. This was consistent with previous studies (e.g., Chater et al., 2023) and the original version of TSIS (Silvera et al., 2001). However, the result of the study was found inconsistent with the established hypothesis regarding the importance of all 21 items of the TSIS. A social skill item, which read as "*I often feel uncertain if what I am doing is right*

around new people" and a social awareness item, which read as "*Other people become angry with me without explaining to me why*" were not found relevant and appropriate to measure the social intelligence construct in the Ethiopian context of the Amharic-speaking public university students.

Conclusion

One of the challenges raised in measuring the social intelligence construct was its abstraction to easily transform into measurable performances or explicit behaviors. Consequently, Silvera et al. (2001) contributed to the TSIS by tackling adequately this measurement issue.

Ethiopia is a country with a diversified population in terms of ethnicity, culture, and religion. The interplay of human-to-human is considered to be essential for existence by the larger community. University students' societal and cultural values, in this regard, cannot be seen as different from the general society. Thus, the plan to adapt and validate the TSIS measure in senior undergraduate students of two public universities would be important bedrock for the investigation of the construct and its relationship with other variables in the future.

It is possible to conclude that the measure would be instrumental material in the elucidation of social cognitive studies for further investigations in the area, and for those researchers who are keen to know about students' ability to get along with others and their ability to understand complex social relationships (i.e., social intelligence). This theoretical contribution will not be negligible because there is still a perception regarding intelligence as a mere cognitive ability, even by a significant number of the academic community.

The measure will have empirical and practical contributions in the area because understanding and knowledge of the level of students' social intelligence

gives important resources to design and develop intervention strategies for the advancement and proper utilization of the attributes. For example, it is possible to mitigate conflicts in universities resulting from a lack of capability of respecting and/or tolerating differences among students from the same and/or different backgrounds. For example, as previous studies indicated (as discussed in the Literature review section), it is possible to increase students' academic effectiveness by maximizing their social intelligence. By understanding the behavioral patterns and trajectories related to social intelligence, and using a reliable and valid measure, it will be then possible to design interventional strategies and/or approaches.

Therefore, from the overall result, it can be concluded that our plan to adapt and validate the TSIS, instead of directly using it because it is a standardized instrument, as appropriate. Apart from the significance that we mentioned above, psychological measures need to be contextualized and validated so that a reliable and valid measure can be obtained. The study in general has shown that the Tromso Social Intelligence Scale (TSIS) in the Amharic version was a reliable and valid measure.

Limitations and Future Recommendations

Despite the contributions the study would have to the theoretical, practical, and empirical developments, we have acknowledged its limitations as well. That is, the confirmatory factor analysis was done on a sample of 173 participants. The limited sample size in the present study arises from methodological reasons. Though this is acceptable in the literature, some authors suggest conducting confirmatory factor analysis on more than 200 cases for better precision and replicability. This can be taken as a limitation of the study.

We, therefore, (a) recommend future researchers test the hypothesized measurement model on a sample size greater than the present study. (b) In the present

study, two items were found unit of the present study context. Future researchers in the area need to compromise on using imported social intelligence measures and recheck the functionality universality before employing them in perceived standardized quality. (c) The study examined and tested the TSIS, which is imported from other cultures. The instrument can help investigate and understand social intelligence attributes that are culture-universal. As an imported material, it may fall short of identifying social intelligence measures that are unique to the present study. Therefore, we recommend future researchers explore these attributes and unique characteristics of the Ethiopian culture through qualitative research. (d) The study confirmed the functional universality of the TSIS factors by examining their relationship with each other. This is one approach to the validity of a measure. We recommend other researchers to investigate the functional universality of the TSIS factors by examining the consequences of social intelligence (other outcome variables).

References

Ackerman, P. L. (1987). Individual differences in skill learning: An integration of psychometric and information processing perspectives. *Psychological Bulletin, 102*(1), 3-27. https://doi.org/10.1037/0033-2909.102.1.3

Bar-On, R. (2000). Emotional and social intelligence: Insights from the Emotional Quotient Inventory. In R. Bar-On & J. D. A. Parker (Eds.), *The handbook of emotional intelligence: Theory, development, assessment, and application at home, school, and in the workplace* (pp. 363–388). Jossey-Bass.

Brown, L. T., & Anthony, R. G. (1990). Continuing the search for social intelligence. *Personality and Individual Differences, 11*(5), 463-470.

Boyatzis, R. E. (2009). Competencies as a behavioral approach to emotional Intelligence. *Journal of Management Development, 28*(9), 749-770.

Boyatzis, R. E., Rochford, K., & Jack, A. I. (2014). Antagonistic neural networks underlying Differentiated leadership roles. *Frontiers in Human Neuroscience*, *8*(114), 1-15. https://doi.org/.10.3389/fnhum.2014.00114

Cattell, R. B. (1987). *Intelligence: Its Structure growth and action*. Elsevier.

Chater, W., Rebhi, M., Saidane, M., Guelmami, N., & Bouassida, A. (2023). Reliability and Validity of the Tromso Social Intelligence Scale (TSIS). *Advances in Physical Education, 13*(01), 53-65. https://doi.org/10.4236/ape.2023.131006

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). New York: Lawrence Erlbaum Associates

Curran, P. J., West, S. G., & Finch, J. F. (1996). The robustness of test statistics to non-normality and specification error in confirmatory factor analysis. *Psychological Methods, 1*(1), 16-29.

Darwish, A.F.E., & Huber, G.L. (2003). Individualism vs Collectivism in Different Cultures: A cultural study. *Intercultural Education, 14*(1), 47-56. https://doi.org/10.1080/1467598032000044647

Davis, J., (2010). *The first generation student experience: Implications for campus practice and strategies for improving persistence and success*. Virginia: Stylus Publishing.

Dodge, K. A., & Pettit, G. S. (2003). A bio-psychosocial model of the development of chronic conduct problems in adolescence. *Developmental Psychology, 39 (2),* 349-371. https://doi.org/10.1037/0012-1649.39.2.349

Dorgan, T., & Cetin, B. (2009). The Validity, Reliability and Factorial Structure of the Turkish Version of the Tromso Social Intelligence Scale. *Educational Sciences: Theory and Practice, 9*(2), 709-720.

Dumont, L. (1986). *Essays on Individualism*. Chicago: University of Chicago.

Durlak, J.A., Weissberg, R.P., Dymnicki, A.B., Taylor, R.D., & Schellinger, K.B. (2011). The

impact of enhancing students' social and emotional learning: A Meta-analysis of school-based universal interventions. *Child Development, 82*(1), 405-432.

Earley, P. C., & Ang, S. (2003). *Cultural intelligence: Individual interactions across cultures*. Palo Alto, CA: Stanford University Press.

Fischer, R., & Smith, P. B. (2021). How Far Can Measurement Be Culture-Free? *Methods and assessment in culture and psychology, 319.* https://doi:10.1017/9781108675475.016

Ford, M. E. (1994). A new conceptualization of social intelligence. In R. J. Sternberg (Ed.). *Encyclopedia of Human Intelligence* (pp. 974-978). NY: Macmillan Publishing Company.

Frankovsky, M., & Birkner, Z. (2014). Measuring Social Intelligence-The MESI Methodology. *Asian Social Science, 10* (6), 1911-2025.

Gini, G. (2006). Brief report: Adaptation of the Italian Version of the Tromsø Social Intelligence Scale to the adolescent population. *Journal of Adolescence, 29*(2), 307-312. https://doi.org/10.1016/j.adolescence.2005.05.003

Grigorenko, E. L. (2000). Heritability and intelligence. In R. J. Sternberg (Ed.). *Handbook of Intelligence* (pp. 53-91). New York: Cambridge University Press. https://doi.org/10.1017/CBO9780511807947.005

Grieve, R., & Mahar, D. (2013). Can social intelligence be measured? Psychometric properties of the Tromsø Social Intelligence Scale—English Version. *The Irish Journal of Psychology, 34*(1), 1-12. https://doi.org/10.1080/03033910.2012.737758

Guilford, J.P. (1967).*The nature of human intelligence*. New York: McGraw-Hill.

Habib, S., Saleem, S., & Mahmood, Z. (2013). Development and validation of social intelligence scale for university students. *Pakistan Journal of Psychological Research, 28*(1), 65–83.

Hair, Jr, J. F., Black, J. W., Babin, B. J., & Anderson, E. R. (2010). *Multivariate Data Analysis* (Seventh Ed.). Edinburgh: Pearson Education Limited.

Hair, Jr. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage Learning; EMEA.

Hofstede, G. (2001). *Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations* (2nd ed.). Sage, Thousand Oaks, CA.

Honeywill, R. (2016). *The man problem: destructive masculinity in Western culture*. Palgrave Macmillan.

Hopkins, M., & Bilimoria, D. (2008). Social and emotional competencies predicting success for male and female executives. *Journal of Management Development, 27*(1), 13-35. psycnet.apa.org/psycinfo/2008-05356-002

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.

Kriemeen, H., & Hajaia, S. (2017). Social Intelligence of Principals and Its Relationship with

Creative Behavior. *World Journal of Education, 7* (3), 84-91. https://doi.org/10.5430/wje.v7n3p84

Kyoung, P. S., Ya Ki, Y., Eunju, S. (2019). Psychometric Properties of the Korean Version of the Tromsø Social Intelligence Scale. *The Korean Academy of Psychiatric and Mental Health Nursing, 28*(2), 165-171. https://doi.org/10.12934/jkpmhn.2019.28.2.165.

Lacanlale, E. P. (2013). Development and validation of a social intelligence inventory. *International Journal of Information and Education Technology, 3*(2), 263–267.

Lawshe, C. H. (1975). A quantitative approach to content validity. *Personnel psychology, 28*, 563-575.

Lee, J.E., Day, J.D., Meara, N. M., & Maxwell, S. E. (2002). Discrimination of social knowledge and its flexible application from creativity: A multitrait-multimethod approach. *Personality and Individual Differences, 32*(5), 913-928. https://doi.org/10.1016/S0191-8869(01)00099-X

Marlowe, H. A. (1986). Social intelligence: Evidence for multidimensionality and construct independence. *Journal of Educational Psychology, 78*(1), 52-58. doi.org/10.1037/0022-0663.78.1.52

Mayer, J., & Salovey, P. (1993). The intelligence of emotional intelligence. *Intelligence, 17*(4), 433-442. https://doi.org/10.1016/0160-2896(93)90010-3

Moss, F.A. Hunt, T., Omwake, K. T., & Woodward, L. G. (1955). *Manual for the George Washington University Series Social Intelligence Test*. Washington, DC: The Center for Psychological Service.

Norenzayan, A., & Heine, S. J. (2005). Psychological universals: What are they and how can we know? *Psychological Bulletin, 131*(5), 763–784. https://doi:10.1037/0033-2909.131.5.763

Ozili, P. K. (2023). The acceptable R-square in empirical modelling for social science research. In *Social research methodology and publishing results: A guide to non-native English speakers* (pp. 134-143). IGI global. https://doi:10.4018/978-1-6684-6859-3.ch009

Park, S., Ya Ki, Y., Eunju, S. (2019). Psychometric Properties of the Korean Version of the Tromsø Social Intelligence Scale. *The Korean Academy of Psychiatric and Mental Health Nursing, 28*(2), 165–171. https://doi.org/10.12934/jkpmhn.2019.28.2.165

Robert, S., Wyer, Jr., & Srull, T. K. (2013). *Social intelligence and cognitive assessments of personality*. *Advances in social cognition.* New Jersey: Lawrence Erlbaum Associate Publishers.

Scherer, K. R. (2007). Componential emotion theory can inform models of emotional competence. In G. Matthews, M. Zeidner & R. D. Roberts (Eds.), *The Science of Emotional Intelligence: Knowns and Unknowns*. (pp. 101-126). Oxford: Oxford University Press

Shrestha, N. (2021). Factor Analysis as a Tool for Survey Analysis. *American Journal of*

Applied Mathematics and Statistics, *9*(1), 4–11. https://doi:10.12691/ajams-9-1-2.

Silvera, D., Martinussen, M., & Dahl, T. (2001). The Tromso Social Intelligence Scale, a self-report measure of social intelligence. *Scandinavian Journal of Psychology, 42*(4), 313–319. http://dx.doi.org/10.1111/1467-9450.00242

Sternberg, R. J., & Berg, C. A. (1986). Quantitative integration: Definitions of intelligence: A comparison of the 1921 and 1986 symposia. In R. J. Sternberg & D. K. Detterman (Eds.), *What is intelligence? Contemporary viewpoints on its nature and definition* (pp. 155-162). Norwood, New Jersey: Ablex.

Sternberg, R. J. (2004). *Handbook of intelligence*. Cambridge, U.K: Cambridge University Press.

Sternberg, R. J., Forsythe, G. B., Horvath, J., Hedlund, J., Snook, S., Williams, W. M. Wagner, R. K., & Grigorenko, E. L. (2000). *Practical intelligence in everyday life*. New York: Cambridge Univ. Press.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using Multivariate Statistics* (5th ed.). New York: Allyn and Bacon.

Wagner, R.K., & Sternberg, R.J. (1985). Practical intelligence in real world pursuits: The role of tacit knowledge. *Journal of Personality and Social Psychology*, *48*, 436–538.

Weis, S., & SuB, H. M. (2005). Social intelligence – A review and critical discussion of measurement concepts. In R. Schulze & R. D. Roberts (Eds.). *An International Handbook of Emotional Intelligence* (pp. 203–230). Gottingen: Hogrefe.

Yamane, T. (1967). *Statistics: An Introductory Analysis* (2nd ed.). New York: Harper and Row.

Zautra, E.k., Zautra, A.J., Gallardo C.E., & Velasco, L.E. (2015). Can we learn to treat one another better? A test of a social intelligence curriculum. *PLoS One, 10*(6). http://doi:10.1371/journal.pone.0128638

Zautra, A.J., Infurna, F.G., Zautra, E.K, Gallardo C.E., & Velasco, L. (2016). The humanization of social relations: Nourishment for resilience in mid-life. *Emotion, aging, and health*, 207-227.