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Adaptation of the Self-Report Family Inventory-II to the Ethiopian Context

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Abstract

The objective of this paper was to adapt the Beaver's Self-Report Family Inventory Version II. The instrument has five sub-scales with a total number of 36 items: Health/ Competence, Conflict, Cohesion, Leadership, and Expressiveness. The instrument was administered to 225 adolescents in Addis Ababa (122 females and 103 males) aged13-18 years, with mean age of 15.72 and standard deviation of 1.17. A written informed consent was obtained from the participants prior to the study. Correlation analysis was employed to determine the components of family competence scale and descriptive statistics was used to summarize the mean and standard deviations of items. Exploratory Factor Analysis was conducted to explore the dimensions of the five factor solutions. The item iterations resulted in four factor solutions: Leadership, Health/Competence, Cohesion, and Conflict. The factor analysis resulted in a four factor solution contributing to 51% of the variance explained. The reliability analysis showed high internal consistency (α=0.90) for the scale, very high internal consistency (α=.95) for Leadership sub-scale, α=.88 for Conflict sub-scale, α=.87 for Cohesion sub-scale, and α=.78 for Competence sub-scale. All the refined items have an average factor loading of over 0.70, showing the items are distinctively loaded on each of the factors and suggesting high convergent validity. Inter-scale correlation ranges from r = -0.2 to .47 and was not statistically significant implying that the items are not convergent or the items distinctively measure their own respective construct.

Keywords: *Self-Report Family Inventory, Family Competence, Exploratory Factor Analysis*

Introduction

Studies of family processes have evolved over the past decades of clinical and research with a wide range of individual and families. Across all the different dynamics that occur within the family (e.g., interaction, roles, rules, patterns), the most common area investigated by scholars is family functioning or adjustment (Goldenberg & Goldenberg, 2008).

Family competence which ranges from effective, healthy functioning through midrange to severely dysfunctional patterns is viewed along a progressive continuum rather

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than in segmented categories. This concept promotes the view that observable and measureable growth and adaption in families is possible competence in small tasks (such as discussing an issue or resolving a conflict). Such small tasks are related to competence in the larger areas of living such as raising children and managing a family (Beavers, 1977; Lewis, Beavers, Gosselt, & Phillips, 1976). Others (e.g. Goldenberg & Goldenberg, 2008; Goodrich, Selig, & Trahan, 2012) defined family competence as the health or competence of the family members in relation with one another. Although this concept is fundamentally important for the well-being of a family and is often used to evaluate family interactions for clinical decision making and interventions, the literature lacks recent analysis and empirical validation of various family functioning assessment tools (Goldenberg & Goldenberg, 2008; Hood & Johnson, 2007). Hood and Johnson (2007) asserted that many of the interpersonal relationship inventories should be considered experimental and are primarily used in research studies.

Through observing, interviewing, and assessing families across a broad spectrum-various socioeconomic groups, ethnic groups, and styles of functioning, a variety of measures and core constructs of interactional family functioning that clearly differentiate healthy from less healthy families were developed (e.g., Family Assessment Device, Family Assessment Measure III [FAM-III], Skinner, Steinhauer, & Santa-Barbara, n.d.), and a considerable amount of research was conducted examining the commonalities and differences between each of these assessment tools (Hampson, Hulgus, & Beavers, 1991; Tutty, 1995). Typically, self-reports and observational methods are used as a means of collecting data regarding how families function (Hood & Johnson, 2007). The Beavers Model of Family Assessment emphasizes family competence. That is, how well a family as an interactional unit preforms the necessary and nurturing tasks of organizing and managing itself (Beavers & Hampson, 2000; Beavers and Hampson, 2003). The major theme of this dimension is the structure of a family unit. The ability of adults to negotiate and share leadership and of the family to establish strong, clear generational boundaries is indicative of competence. Conversely, weak adult coalitions, which may include a parent-child coalition and ineffective leadership, are indicators of lower levels of systems competence. Competent families are more readily able to resolve conflict and communicate openly and directly. It is important that family members know who is a parent, who is a child, and operate accordingly (Beavers & Hampson, 2003). A series of statements based on observational research have evolved into Self-Report Family Inventory, which is a series of statements that an individual

family member fills out regarding his or her perceptions of that family. The Beaver's Self-Report Family Inventory (SRFI) Version II is one of the instruments developed by Beavers and Hampson in 1990 to assess parenting practices using self-report and observational methods. The Self-Report Family Inventory (SRFI) is best used for a quick access to information and it is easy to administer. To have a comprehensive assessment of family, the same SRFI can be used as a tool for interview for a qualitative research. More information can be gathered if it is used while observing the family with their consent. The great advantage of SRFI is that it gives the respondents' own views directly. It also gives access to phenomenological data, i.e., respondents' perceptions of themselves and the world, which are unobtainable in any other way. Furthermore, self-report methods can be used to obtain information in situations where observational data are not normally available. More importantly, researchers using self-report methods are able to study large samples of people fairly easily; able to examine a large number of variables; and can be carried out relatively cheaply.

According to Beavers and Hampson (2000), validity of the SRFI was measured by correlating the SRFI with the observational scales of the Beavers System Model. The results indicate a high degree of convergence of family constructs across the two methods at .62 or above (Beavers & Hampson, 2000). The authors of the instrument also reported high internal consistency reliability with Cronbach alphas between .84 and .93 and test-retest reliabilities of .85 or better. SRFI is roughly equivalent to observations (Drumm, Carr, & Fitzgerald, 2000). The instrument was administered to children's mothers and fathers in Western Cultural context. The scale authors reported test-retest correlations for 1-3-month retest period as follows: Family Health/Competence, .84-.87; Conflict, .50-.59; Cohesion, .50-.70; Leadership, .41-.49; and Expressiveness, .79-.89. Cicchetti (1994) classified correlations between 0.4 and 0.59 as fair, 0.60 to 0.74 as good, and above 0.75 as excellent; which makes SRFI acceptable. SRFI is a very helpful tool to be used in school environment for teachers and counsellors to plan future programs in order to help the children with complicated family background.

The researcher believes that this instrument should be adapted to different cultures to ensure its applicability across cultures and more importantly in the Ethiopian cultural context. This is because the conceptualization of family competence and sub-scales (factors) measuring the construct may differ from culture to culture. Thus, this instrument adaptation was made to test if this scale/sub-scales are applicable in our context and come up with refined items and sub-scales.

Objectives of the Instrument Adaptation

The main objective of this study was to adapt the instrument Beaver's Self-Report Family Inventory (SRFI) Version II in the Ethiopian socio-cultural context. The instrument adaptation had two specific objectives. (i) to explore the components or underlying dimensions of the Beaver's Self-Report Family Inventory (SRFI); (ii) to determine the internal consistency of items in the different sub-scales measuring family competence.

Review of Related Literature

Beavers and Hampson (2000) indicated that family competence encompasses observable and measurable behaviors such as discussing issues among family members, resolving conflicts, guiding their children to develop socially responsible behaviors. All these patterns of measurable behaviors should be seen as a progressive continuum, not as segmented categories. Over the past years, a variety of measures and constructs of interactional family functioning that clearly differentiate healthy from less healthy families have been developed. Family assessment instruments typically fall into three categories: client self-report, observation, and interviews. Observation and self-report are the most commonly used tools of obtaining vital information about families: the first from an outsider (i.e., researchers) and the second from an insider perspective (Hamilton & Carr, 2016). Previous literature on family assessment also includes the use of instruments to generate information for child welfare in the family context (Pinsof, Zinbarg, Lebow, Knobloch-Fedders, Durbin, Chambers, et al. (2009) and guides for developing comprehensive assessment strategies as part of community-based child welfare services reform (Pinsof, 2010).

Based on observational research, a series of statements have evolved into Self-Report Family Inventory that an individual family member fills out regarding his or her perceptions of that family. The Beaver's Self-Report Family Inventory (SRFI) Version II is one of the tools for measuring family competence using self-report method. The SRFI gives the respondents' the right to reflect their own assessment of the family competence in their own views directly, report on their perception of experiences in the family, and the self-report methods can be used to obtain information in situations where observational data are not available (Beavers & Hampson, 2000).

Self-Report Family Inventory enables to access individual family members' perceptions of family competence, style, and several related qualities. The SRFI provides

a Competence Score for each member and a Cohesion Score, which is used as an estimate of Family Style. This factor addresses closeness, togetherness, and tendencies to enjoy time and activities together; as such it is an approximation of some of the major family themes related to style. In addition, clinically useful scales of Conflict, Leadership, and Emotional Expressiveness can be derived from the questionnaire. The SRFI is a 36-item measure of perceptions of family functioning in five domains: Health/Competence, Conflict, Cohesion, Leadership, and Expressiveness (Beavers &Hampson, 2000). RFI is best used for a quick access to information, i.e., simplified administration and scoring, and provides a unique insider view of family life. It can also be used as a tool for interview for a qualitative research and this will help to have a comprehensive assessment of the family competence (Beavers & Hampson, 2000).

Assessing family environment especially the family relationship plays a very important role in the well-being of family members (Lambert, 2010). SRFI can help teachers, counselors and other helping professionals to identify the family functioning so that further plans can be done to improve relationship among family members. Researchers and clinicians in many countries have invested in the Beavers System Model, and utilized the SRFI and/or other assessment methodology. These include. Canada (Laporte, Barcoux, & Guttman, 2001), Ireland (Car, 2000; Druman, Carr & Frizgerald, 2000), Finland and Norway (Haugland & Havik, 1998), and Sweden (Sundelin & Hansson, 1999). Empirical findings in other contexts showed that there are validation studies of SRFI which could not replicate its five subscales/factors in their contexts. For example, the Chinese version of the Self-Report Family Inventory revealed the existence two stable factors (Family Health and Family Pathology) abstracted from the SRFI (Shek, 1998). Further, Goodrich, Selig, & Trahan (2012) explored the factor structure of the Self-Report Family Inventory with a sample of heterosexual 440 parents. The results showed existence of two factor solution consisting of positive and negative aspects of family functioning for this inventory across diverse samples of families.

There has been a continued development and use of the SRFI assessment scale due to its increased use in clinical utility for therapists and researchers to help intervention planning and measure changes in the family competence. The countries (Canada, Ireland, Finland and Norway, Sweden, and China) used the findings of their research for training, further research, and treatment. The outcomes of the family assessments were used to assist families through family counselling (Beavers & Hampson, 2003).

In Ethiopia, many families fail to function properly due to limited (or lack of) skills and competencies, occurrence of conflict among family members, lack of proper family communication, etc. While the SRFI is an important instrument, there is no any study conducted to validate or adapt the instrument in the Ethiopian context. This necessitates the need to adapt the SRFI and draw implications for future research and practice.

Method

Design of the Study

Correlation matrix approach was employed to determine the components of the Self-Report Family Inventory for measuring family competence. In addition, the researcher employed a descriptive design to investigate the psychometric characteristics of the instrument.

The Instrument: Beaver's Self-Report Family Inventory (SRFI) Version II

The Self-Report Family Inventory: Version II (SRFI) is a 36-item measure of perceptions of family functioning in five domains/sub scales: Health/Competence, Conflict, Cohesion, Leadership, and Expressiveness. The scale was developed for family members who were 11 years or older. The instrument is a screening device to assess a family member's view of overall family competence, based on the Beaver's Systems Model of family functioning. Each item is rated on a 5-point scale; for the first 34 items, the scale descriptors are 1 = YES: Fits our family very well, 3 = SOME: Fits our family somewhat, and 5 = NO: Does not fit our family. The last two items have response scales specific to the items, which requires adolescents' overall rating of their family functioning and independence. 18 items were reverse scored. The instrument had high internal consistency reliability with Cronbach alphas between .84 and .93 and test-retest reliabilities of .85 or better (Beavers & Hampson, 2000).

Participants

The instrument was administered to 225 adolescents (103 male and 122 female) whose age ranged from 13-18 years, with mean age being 15.72 and standard deviation of 1.17. Hair, Black, Babin, and Anderson (2010) recommend that a sample size of 200 is adequate to run an exploratory factor analysis. All the respondents were attending their education in grade 8 in Addis Ababa at the time of the data collection (2019). The researcher identified a primary school in Addis Ababa City using the already established contact with the school director and the Woreda Women, Children, and

Youth affairs Office. Hence, the school was selected using convenient sampling followed by selection of participants using purposive sampling technique. Inclusion criteria include**:** adolescents (males and females) whose age ranges from 13-18 years; students with no severe disability or limited Amharic proficiency; and students who were willing to spend two hours to fill survey questionnaire.

Administration Procedure

The instrument was translated into Amharic language (forward translation) by a professional translator before administering it to the participants. Some of the feedback given include: ensuring conceptual equivalence of words or phrases, making translation simple and clear, avoiding long phrases, and using language that could be understood by most of the audience. The translated tool was reviewed by two psychology instructors who provided their feedback. Based on the feedback, the translated instrument was revised before it was administered to adolescents.

The researcher contacted the director of Addis Berihan government primary school in Addis Ababa to get permission from the school administration and access participants for the primary data collection. The school director was briefed about the purpose of administering the instrument, and then requested to give the necessary permission to collect primary data from students. After obtaining permission from the school director, it was agreed to ensure that the data collection should not conflict with the students' class schedule. Hence, data collection was conducted immediately after the students finished their class (after 3 PM). A written informed consent was obtained from the participants.

In consultation with the school director, free rooms, tables, chairs, and pens were availed for students to fill the questionnaire. The researcher made sure that all the participants could read and write Amharic language before they start filling the questionnaire. Following this, a fifteen minutes' orientation on the purpose of the study was given to participants. The researcher informed the participants that participation was voluntary and also assured them full confidentiality (i.e., they were not required to write either their names or their addresses). These were indicated in written form at the beginning of the questionnaire and explained by the researcher during data collection.

One research assistant with psychology background participated in assisting the data collection. The research assistant was given orientation on the objectives of the research,

data collection procedure, basic contents of the instrument, and ethical considerations. The researcher used paper pencil method of administration because all participants were able to read and write. The translated questionnaire was administered to each respondent and it took approximately 30-35 minutes for each participant to complete the questionnaire. All copies of the questionnaires were filled by the respondents and the response rate was 100%.

Data Analysis

The data were analysed by Statistical Package for Social Sciences (SPSS) version 23. Exploratory Factor Analysis with Varimax Rotation[9] was used to extract the five factor solutions. Varimax Rotation was used because the subscales are orthogonal. Descriptive statistics such as mean and standard deviation were used to analyse the age, sex, parents' marital status, education and occupational status of the respondents and their parents. After a series of iterations, mean and standard deviation of the refined items, Cronbach's Alpha for the four factors and inter-sub scale correlation was computed and interpreted.

Results

This section presents the results of the data analysis: sample characteristics, descriptive statistics, reliability measure of the instrument, and exploratory factor analysis.

Socio-demographic characteristics

A total of 225 adolescents (103 males and 122 females) participated as informants for this study. Their age ranges from 13-18 years. Significant proportion of the respondents (34.2%) were 15 years old, 28% were aged 16 years old, 15.6% of the respondents were17 years, and 12.4% of them were 14 years old. Those respondents with age 18 and 13 years old accounted for 8.9% and .9% respectively. The majority of the respondents (75.6%) stated that they live with both biological parents, 14.2% reported that they live with one of their parents (mothers or fathers), and 2.7% live with siblings (either as a head of the family or member of the siblings). Only 2.2% and 5.3% live with their uncles/aunts and grandparents respectively.

The majority of children's parents (77.3%) were married, 12.9 % were divorced, and 6.2% were widowed. Quite few (3.6%) of their parents had never been married or

9 **Varimax Rotation** is a statistical technique used at one level of exploratory factor analysis as an attempt to clarify the relationship among factors by adjusting the coordinates of data.

were not married at the time of data collection. Those who have completed diploma, first degree and masters were 2.7%, 1.3%, and 0.4% respectively. Quite few (2.2%) of adolescents' fathers were illiterate. As to their mothers' education, nearly 42% had attended grades 1-4 and 36.9% had attended grades 5-8. Those who attended grades 9-10 and 11-12 were 10.6% and 4.4% respectively. The proportion of mothers who earned diploma, first degree and master's degree were 0.4% each. Just 4.9% of their mothers were illiterate. The majority (81.3%) of the children's fathers was engaged in private business, 9.3% were employed in government institutions, and only 1.3% was employed in non-governmental organizations. Just 8% of them were not employed. More than half of the children's mothers (51.6%) were not employed, 41.3% were engaged in private business, 5.8% were employed as civil servant, and quite very few (1.3%) were employed in non-governmental organizations.

Assumptions of Exploratory Factor Analysis

The following assumptions were checked before doing factor analysis.

Multivariate normality: data normality was examined before the data were processed. To know whether the data were normally distributed or not, normality test using SPSS was used. The result of Kolmogorov-Smirnov test shows with value Asymp. Sig. > 0.05, suggesting evidence of normality. The Skewness value ranges from 0.05 up to 0.3. In addition, Schapiro-Wilk test shows P-value is less than 0.05, suggesting that the data were normally distributed.

Multicollinearity: a test of multicollinearity was calculated using Variance Inflation Factor (VIF). The data showed a VIF of 3.2. A VIF less than 4.0 is acceptable (Hair, Black, Babin, & Anderson, 2010). This means that the data do not show the existence of strong correlation between sub-scales in the SRFI measuring family competence.

Homoscedasticity plot: this assumption was checked and the result shows that the amount of distance from the line to the dot did not marginally increase as it moves up the line (Hair, et al., 2010). This suggests that the data are homoscedastic. It also means the average distribution of scores of family competence scale across adolescents is approximately normal.

Correlation Matrix of all items

A Correlation Matrix for all Items in the Self-Report Family Competence Scale shows the result of a correlation analysis with value of correlation coefficients. The magnitude

of correlation between items ranges from -0.21 (the lowest) to 0.95 (very high). Looking into the magnitude of correlation between items, the correlation between item4 with items 6 and 7 is .38 and .39 respectively. The correlation between item 21 and item 11 is 0.8, and item 12 and item 11 is 0.46. The correlation between item 15 and 17 was 0.42. The correlation between item 23 and item 30; and item 23 and 35 is -0.21 (the lowest). Those items with a positive linear correlation appear to measure the same construct. There are items that do not have any kind of relationship. For example, the relationship between item 30 and 16, and item 32 and item 26 and 8 is 0. This means that these items may not adequately measure the same characteristics or not relevant to our context.

Communalities and Total Variance Explained for Self-Report Family Inventory

Table 1: Communalities

Items	Initial	Extraction
Item 4	I	.354
Item 5	I	.421
Item 9	I	.418
Item 11	I	.635
Item 12	I	.469
Item 14	I	.983
Item 15	I	.983
Item 16	I	.946
Item 17	I	.266
Item 18	I	.275
Item 23	I	.187
Item 24	I	.963
Item 26	I	.963
Item 27	I	.207
Item 32	I	.221
Item 33	I	.428
Item 34	I	.237
Item measuring adolescents' rating of their family competence-35	I	.300

Table 1 above shows the contribution of each item in the four factors to the total variance in the family competence measurement scale. For example, item4 extracted from the four factors contributed 35.4%; item 5 contributed42.1% of the variance in the overall family competence scale. Item 9 contributes 41.8% and item 11 contributes 63.5% of

the variance in the family competence scale. Likewise, item 24 and 26 each contributed 96.3%. Item 14, 15, and 16, each contributed 98.3%, 98.3% and 94.6% respectively. Item 14 and 15 have the highest contribution (98.3%) and item 23 contributed only 18.7% of the total variance.

Table 2: Total Variance Explained-extracted factors

Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Tot-al	% of Variance	Cumul-ative %	Total	% of Variance	Cumul-ative %	Total	% of Variance	Cumul-ative %
3.10	17.23	17.23	3.10	17.23	17.23	2.97	16.51	16.51
2.55	14.20	31.42	2.55	14.20	31.42	2.56	14.23	30.74
2.29	12.73	44.15	2.29	12.72	44.12	2.14	11.86	42.60
1.23	6.81	50.96	1.23	6.81	50.96	1.51	8.36	50.96

Table 2 above shows total variance explained by the four factors, before and after rotation. Accordingly, before rotation, the first factor contributed 17.23%, 2nd factor 31.42%, 3rd factor 44.12% and 4th factor 50.96% of the total variance. After rotation, the first factor contributed 16.51%, the second factor 30.74%, the third factor 42.6%, and the fourth factor contributed about 51% of the variance in the family competence measurement scale. There is a slight decrease in the contribution of each factor after rotation. In general, the four factors resulted in 51% of the variance explained in the whole scale. Although the suggested minimum acceptable explained variance in factor analysis is 60% (Hair, Sarstedt, Pieper, & Ringle, 2012), this is not the practical in most cases. Hence, 51% explained variances are acceptable.

Exploratory factor analysis was conducted to explore the underlying dimensions of the five factor structures of the Self-Report Family Inventory II Scale. The four factor solutions resulted in 51% of the variance of the items explained. In order to reach the four factor structures, cross loading items (those items whose difference was below 0.2) and those items with low factor loading were deleted in a rotation method using Variance with Kaiser Normalization (Hair, Black, Babin & Anderson, 2010). Rotation was converged in 5 iterations. Initially, there were 36 items in the Self-Report Family Inventory Scale.

I) First Step Items' Deletion/Iteration Process: in the first iteration, 5 items (item 8, 19, 21, 22, 25) were deleted.

II) Second Step Items' Deletion/Iteration Process: in the second iteration process, 3

items (item 1, 2, and 3).

III) Third Step Item's Deletion/Iteration Process: in the third iteration process, 3 items (item 6, 20, and 36) were deleted.

IV) Fourth Step Item Deletion/Iteration Process: in the fourth stage, 3 items (item 7, 10, 31) were deleted and moved to the fifth stage.

V) Fifth Stage Item Deletion/Iteration Process: in the fifth stage, 7 items (item 13, 28, 29, 30).

Following five iterations, out of the 36 items, 18 items were deleted. When the items were progressively reduced, their contributions to the four factor solutions has increased. Using exploratory factor analysis, iterative procedure of deleting cross loading items with less than 0.2 value resulted in a four factor solution contributing 51% of the variance in the Self-Report Family Competence Measurement Scale.

Descriptive Statistics of the Refined Items

Table 3: Mean and Standard Deviation of Refined Items Measuring Family Competence (N=225)

Factor	List of Refined Items and Code	*M*	*SD*	
Leadership	Family Competence 14	2.99	1.35	
	Family Competence 15	2.99	1.35	
	Family Competence 16	3.07	1.38	
Family Cohesion	Family Competence 9	2.31	1.43	
	Family Competence 11	2.60	1.56	
	Family Competence 12	1.68	1.05	
	Family Competence 33	2.02	1.24	
Health/Competence	Family Competence 4	1.94	1.20	
	Family Competence 34	2.55	1.40	
	Overall Rating of Family 35	1.80	.98	
	Family Competence 27	2.64	1.49	
	Family Competence 17	1.91	1.20	
Conflict	Family Competence 24	3.09	1.58	
	Family Competence 26	3.09	1.58	
	Family Competence 23	3.69	1.40	
	Family Competence 5	2.33	1.54	
	Family Competence 32	3.26	1.53	
	Family Competence 18	2.98	1.74	

Table 3 above shows the descriptive statistics for clustered items under each factor. For those items measuring Leadership sub-scale (Factor 1) as one component of family competence, the mean scores for the three items was almost similar. For items 14 and

15, the mean score was 2.99 each and the mean score for the item 16 was 3.07.The standard deviation for items 14 and 15 was 1.35 each, and for item 16, the mean score was1.38. This shows that there is no major difference in the deviation of individual scores from the mean score for the three items.

There were four items measuring Family Cohesion sub-scale (Factor 2). Accordingly, the mean score for items 9, 11, and 12 was 2.31, 2.60, and 1.68 respectively. Likewise, the mean score for item 33 was 2.02. The standard deviation for items 9, 11, 12, and 33 were 1.43, 1.56, 1.05, and 1.24 respectively.

Five items were identified measuring Health/Competence sub-scale (Factor 3). The mean scores for items 4, 34, and 35 were 1.94, 2.55, and 1.80 respectively. The mean scores for item 27 and 17 were 2.64 and 1.91 respectively. The standard deviation for item 4, 34, and 35 was 1.2, 1.4 and .98 respectively. The standard deviation for items 27 and 17 was1.49 and 1.2 respectively.

Six items which measure Family Conflict sub-scale (Factor 4) were selected. The mean scores for items 24 and 26 were 3.09 each with standard deviation of 1.58; and the mean score for item 23 is 3.69. The mean scores for item 5, 32, and 18 were 2.33, 3.26, and 2.98 respectively. The mean scores for item 23 and 32 were higher than each of the other four items measuring Family Conflict. The standard deviation for item 23 was 1.4, and the standard deviation for items 5 and 32 is almost similar (1.53). The standard deviation for item 18 was 1.74. Overall, there was no major difference between the standard deviation of individual scores from their respective means for the all items measuring conflict sub-scale.

Reliability of the four Sub-Scales

A reliability measure to check the internal consistency of items for each sub-scale as well as for all refined items is presented in the following table.

Table 4. Reliability Measures of the Four Factors Measuring Family Competence (N=225)

Factors	Number of Items	α
Leadership	3	.95
Family Cohesion	4	.87
Health/Competence	5	.78
Conflict	6	.88
All refined items	18	.90

Table 4 shows the internal consistency of items within each factor or sub-scale as well as for all refined items in the Self-Report Family Inventory II for Measuring Family Competence Scale. Reliability measure of the items in the different factors/components of the scale instrument reported internal consistencies with Cronbach alphas between .78 and .95. Looking into the component measures, three items which measured leadership as a component of family competence measurement scale had an alpha coefficient (α=.95), suggesting the items had very high internal consistency. Four items measuring family cohesion had good level of internal consistency (α=.87). Five items measuring health/competence had acceptable level of internal consistency (α=.78). Six items measuring conflict as one component measure of Self-Report Family Inventory had good level of internal consistency (α=.88). Overall the reliability measure (internal constancy) of the 18 refined items was found to be excellent (α=.90), which shows high interrelatedness of items.

Inter-correlation of the four sub-scales

Once the reliability of refined items for each sub-scale was computed, inter-correlation of sub-scales was calculated, and its statistical significance was checked.

Table 5. Sub-scale inter-correlation (Pearson Correlation)

	Leadership SS	Family Cohesion SS	Health/ Competence SS	Conflict SS
Leadership Correlation Coefficient	1.0			
Family Cohesion Correlation Coefficient	-1.0	1.0		
Health Correlation Coefficient	-.02	.47**	1.0	
Conflict Correlation Coefficient	.09	-.02	-0.1	1.0

**. Correlation is significant at the 0.01 level (2-tailed).

Table 5 shows inter-correlation of the four sub-scales. Accordingly, the correlation between Leadership with Family Cohesion, Health/Family Competence, and Conflict subscales was not statistically significant. Similarly, the correlation between Family Cohesion with Conflict sub-scales was not significant. The correlation between conflict sub-scales with Health/Competence subscale was also not statistically significant. Correlation between Health/Competence sub-scale with Family Cohesion sub-scales was found to be statically significant at 0.01 level (r=.47). Despite this, the magnitude of correlation (r=.47 was less than 0.70) which is very low. The fact that the inter-correlation among the four sub-scales was not significant implying that the scale was multidimensional and items measuring in each sub-scale were not convergent or items are orthogonal. Putting it differently, the items distinctively measured their own respective psychological construct.

Table 6: Rotated Component Matrix

Items	Components/Factors			
	1	2	3	4
Item measuring family Leadership-14	.99			
Item Measuring Family Leadership-15	.99			
Item Measuring Family Leadership-16	.97			
Item Measuring Family Cohesion-9		.82		
Item Measuring Family Cohesion-12		.86		
Item Measuring Family Cohesion-33		.83		
Item Measuring Family Cohesion-11		.85		
Item Measuring Health/Competence-4			.75	
Item Measuring Health/Competence-34			.69	
Item Measuring Overall Health/Competence-35			.85	
Item Measuring Health/Competence-27			.79	
Item Measuring Health/Competence-17			.80	
Item Measuring Conflict in the Family-24				.97
Item Measuring Conflict in the Family-26				.97
Item Measuring Conflict in the Family-23				.86
Item Measuring Conflict in the Family-5				.68
Item Measuring Conflict in the Family-32				.90
Item Measuring Conflict in the Family-18				.78

In table 6, factor loading[10] of each item within the four factor solutions is presented.

10 **Factor loading** is basically the correlation coefficient for the variable and factor, between observed

The first factor comprised of items 14, 15 and 16loaded in this factor. Items falling on the first factor measured family leadership. 98.01% of the variance in each of the times 14 and 15 was explained by family leadership factor; while 94.09% of the variance in item 16 was explained by leadership factor. On average, 98.3% of the variance in the three items was explained by the leadership factor.

Four items (9, 11, 12, 33) were loaded in the family cohesion factor. 67.24% of the variance in item 9, 72.25% of the variance in item 11, 73.96% of the variance in item 12, and 68.90% of the variance in item 33 is explained by the family cohesion factor. 56.25% of the variance in item 4, 47.61% of the variance in item 34, 72.25% of the variance in item 35, 62.41% of the variance in item 27, and 64% of the variance in item 17 was explained by the health/competence factor. Likewise, 94.09% of the variance in each of the times 24 and 26 was explained by family conflict factor. 73.96% of the variance in item 23, 46.24% of the variance in item 5, 81% of the variance in item 32, and 60.84% of the variance in item 18 was explained by the family conflict factor. The six items (5, 18, 23, 24, 26, and 32) in the family conflict sub-scale had average factor loading .86. All items in the four factors had an average factor loading of greater than .70, which indicated that the items were loaded distinctly to each of the factor. This implies that all items in each factor had high convergent validity.

In this section, the refined items measuring family competence, descriptive statistics of items in each sub-scale, factor loadings, and internal consistency of items in each sub-scale is presented.

Table -7 Results of Exploratory Factor Analysis (N=225)

Factors	Construct/Items	*M*	*SD*	Loadings	α
Factor 1 (Leadership)	The grownups are strong leaders.	2.99	1.3	.99	.95
	The grownups have skills to manage the family.	2.99	1.35	.99	
	Believe in the strong leadership of our parents.	3.07	1.38	.97	
Factor 2 (Family Cohesion)	We touch and hug each other.	2.31	1.43	.82	.87
	We feel loved at home.	2.60	1.56	.86	
	We are often happy.	1.68	1.05	.83	
	We speak to our minds.	2.02	1.24	.85	

variable and latent common factors. Factor loading shows the variance explained by the variable on that particular factor.

Factor 3 (Health/ Competence)	The grownups understand and agree on family decision.	1.94	1.20	.75	.78
	We take responsibility for our behavior.	2.55	1.40	.69	
	My family functions well.	1.80	.98	.85	
	We do things with others.	2.64	1.49	.79	
	Family is hopeful	1.91	1.20	.80	
Factor 4 (Conflict)	One of the adults has a favorite child.	3.09	1.58	.97	.88
	Parents are partial to children.	3.09	1.58	.97	
	It is okay to fight and yell.	3.69	1.40	.86	
	Grownups compete each other	2.33	1.54	.68	
	One person controls our family.				
	Blame one person when things are not rights	3.26	1.53	.90	
		2.98	1.74	.78	

Table 7 shows the results of exploratory factor analysis. In the process of factor analysis, items were refined through five iterations. In the process of conducting exploratory factor analysis, iterative procedure of deleting cross loading items was done and this resulted in a four factor solutions. Accordingly, 18 items were deleted and 18 refined items were maintained. The four factor solutions included: Leadership, Family Cohesion, Health/ Competence, and Conflict. Three items measure family leadership, four items measure family cohesion, five items measure health/competence, and six items measure conflict sub-scale.

The three items measuring family leadership had more or less the same mean scores. The mean of the items for factor one ranged from 2.99-3.07 with a difference of .08. Their standard deviation ranged from 1.35 to 1.38, with small difference of 0.03. Factor loading for three items in the first factor was high (ranges from .97 to .99 with small differences of .02). The reliability measure of the three items showed very high internal consistency (α=.95).

The second factor (Family Cohesion) had four items. The mean of the items ranged from 1.68 to 2.60 with mean differences of .92. The standard deviation for the items ranged from 1.05-1.56, with slight difference of 0.51. Factor loading for the items ranged from .82-.86, with differences of .04. The reliability measure of the four items showed good level of internal consistency (α=.87).

The third factor (Health/Competence) had five items. The mean score of the five items ranged from 1.80 to 2.64, with differences of .73 between the highest and lowest mean scores. The standard deviation for the items ranged from 0.98 to 1.49 with differences of 0.51. Factor loading of the items ranged from .69-.85, with differences of .16. The reliability measure of the five items showed an acceptable level of internal consistency (α=.78).

The fourth factor (conflict sub-scale) had six items. The mean scores of the six items ranged from 2.33 to 3.69, with mean differences 1.36. The standard deviation for items ranged from 1.40-1.74, with differences of 0.34. Factor loading of the items ranged from .68-.97, with slight difference of .29.The reliability measure of the six items shows good level of internal consistency (α=.88).

Discussion

As mentioned earlier, the objectives of the instrument adaptation study were; (a) to explore the components or underlying dimensions of the Beaver's Self-Report Family Inventory (SRFI); (b) to determine the internal consistency of items measuring the family competence sub-scales. The original instrument had five subscales: Health/ Competence, Conflict, Cohesion, Leadership, and Expressiveness (Beavers & Hampson, 1990; Beavers & Hampson, 2000; Beavers & Hampson, 2003). In contrast to the original instrument, the findings of the instrument adaptation in Ethiopia resulted in a four-factor structure (sub-scales): Family Health/Competence, Conflict, Cohesion, and Leadership. The discrepancy in the number of factors may be interpreted in terms of the unique characteristic of Ethiopian people. The original items measuring expressiveness sub-scale were deleted through iteration process. The possible explanations for this are (a) The original items may not be relevant to our cultural context; (b) in Ethiopia, the existing cultural context, families, schools, and the wider society may not provide adequate platforms and opportunities for adolescents to express their opinions on issues impacting their lives. Ethiopian people are not often encouraged to express their views and emotions about their families in their socialization process and, as a result of this; they may lack the ability, perspective, and/or language in evaluating one's family. Such socialization experiences would then create a situation where one would have a rather undifferentiated view about the family. This could limit their expressiveness behavior in the family, school, and other contexts.

When the present data are compared with the previous factor-analytic studies, one obvious discrepancy is the number of dimensions intrinsic to the SRFI. Unlike the five factors proposed by Beavers and Hampson (1990), report on the validation of the Chinese version of the Self-Report Family Inventory revealed the existence of two stable factors (Family Health and Family Pathology) abstracted from the SRFI (Shek, 1998). The finding of the study suggested that social work and clinical practitioners should be cautious in using the subscales in the SRFI and that they should be conscious of cultural variations in the application of family assessment tools. Further effort should be made to clarify the dimensionality of the SFI. Similarly, Goodrich, Selig, & Trahan (2012) explored the factor structure of the Self-Report Family Inventory with a sample of heterosexual 440 parents who have a son or daughter. The results showed existence of two factor solution consisting of positive and negative aspects of family functioning for this inventory across diverse samples of families.

The result of instrument adaptation showed that the Self-Report Family Inventory scale has high reliability with a Cronbach alpha value of 0.90, suggesting the items had high internal consistency in the Ethiopian cultural context. The result is consistent with the previous results in which the instrument reported high internal consistencies reliability with Cronbach alphas between .84 and .93 and test-retest reliability of .85 (Beavers & Hampson, 2000). The fact that the instrument for the full scale shows high reliability implies that the items are relevant to our context. Looking into the internal consistency of items in each sub-scale, the result of the instrument adaptation showed that Leadership sub-scale had a Cronbach alpha value of 0.95 compared to the original sub-scale which has a Cronbach alpha value of .41-.49. For Family Cohesion sub-scale, reliability of items was found to have an alpha value of 0.87, compared to the original sub-scale having a Cronbach alpha value of .50-.70. For Conflict sub-scale, the reliability of items reported a Cronbach alpha value of 0.88, compared to the original value of .50-.59. The result of the instrument adaptation also revealed that Family Health/Competence had a Cronbach alpha value of .78, compared with .84 -.87 in the original instrument. Except the Health/Family Competence sub-scale which showed slight reduction, the three sub-scales (Leadership, Family Cohesion, and Conflict) showed significant improvement in their internal constancies from the original values. This shows an improved reliability and ecological validity of items in the Ethiopian context, and the functionality of items is very high in the Ethiopian context.

Finally, the Exploratory Factor Analysis conducted to check the contribution of the four factor structures in the Self-Report Family Competence Scale resulted in 51% of the variance was explained. As suggested by Hair et al. (2012), it is common to consider a solution that accounts for 60 percent of the total variance (and in some instances even less) as satisfactory. As this is not practical in most cases, 51% of the cumulative variability explained by these four factors in the extracted solution is acceptable. Although other researchers and clinicians used the SRFI in different cultural contexts (Laporte, Barcoux, and Guttman, 2001; Car, 2000; Druman, Carr & Frizgerald, 2000), the researcher could not find any evidence of the total variance explained for the original scale for comparison.

Conclusion

The objectives of the instrument validation were to explore the factor structures of the Beaver's Self-Report Family Inventory in the Ethiopian context, and determine the internal consistency of refined items. The original Self Report Family Inventory had five sub-scales (Health/Competence, Cohesion, Conflict, Leadership, and Expressiveness). After five iterations, the number of items were refined and reduced to 18, which resulted in a four factor solutions/subscales: Leadership, Health/Competence, Cohesion, and Conflict.

The progressive iterations led to the deletion of cross loading items and further refinement. The progressive reduction of cross loading items increased the contribution of items four factors/sub-scales. While Beavers suggested the original instrument has five sub-scales, findings of other studies (Shek, 1998; Goodrich, Selig, & Trahan, 2012), and current study confirmed that the five factors may not be applicable to different contexts. This necessitates the need to adapt or validate the instrument when using the scale in different cultural contexts.

Using Exploratory Factor Analysis, iterative procedure of deleting cross loading items resulted in a four factor solutions contributing 51% of the variance in the Self-Report Family Competence Scale.

The reliability of all items four factors/sub-scales measuring family competence was found to have a Cronbach alpha value of 0.90, suggesting the items had high internal consistency. Of the four sub-scales, items measuring Leadership sub-scale had very

high internal consistency (α=.95) compared to those items measuring cohesion, health/ competence, and conflict subscales. The four items measuring Family Cohesion had good level of internal consistency (α=.87). Five items measuring Health/Competence sub-scale have acceptable level of internal consistency (α=.78). Six items measuring Conflict sub-scale have very good internal consistency (α=.88). Overall, the reliability of items for the full scale and the four sub-scales reported to high internal consistency. This implies that that the subscale adequately measures the construct of family competence in the Ethiopian context.

Inter-scale correlation of the four sub-scales was found to be not statistically significant. This shows that the items were not convergent or they measure their respective constructs. Further, the items were distinctively loaded in the first, second, third and fourth factors/sub-scales, suggesting high convergent validity. Hence, it can fairly be concluded that the refined items can be used to measure family competence in the Ethiopian socio-cultural context.

The finding shows the non-existence of expressiveness in our schools implies that parents and teachers have to encourage adolescents to express their views on matters impacting their lives including in education, and enhance their expressiveness.

Future researchers who are interested in using SRFI need to validate the instrument in different contexts (rural, urban, adolescents from different socio-economic backgrounds, males and females) to understand if the original scale having five factors or the current adapted instrument with four factor solutions (sub-scales) is consistent with other groups.

It is important for researchers to further validate this inventory with a confirmatory factor analysis and/or a convergent validity study to ensure that the instrument measures what it purports to measure. Convergent validity could be completed with other family assessment devices such as the General Family Functioning subscale of the Family Assessment Device or the Family Assessment Measure III, among others.

Teachers, counsellors/social workers, discipline masters in school, and clinical practitioners can use Self-Report Family Inventory to plan programs in order to help students with complicated family background, and to aid in assisting families to increased levels of functioning. And yet, social work and clinical practitioners should be cautious in using the subscales in the SRFI and that they should be conscious of

cultural variations in the application of family assessment tools. Further effort should be made to clarify the dimensionality of the SRFI.

Finally, each of the extant studies of the SRFI explored family competence at one single time in the family's life. Evidence of the psychometric behavior of the SRFI over time is required to support its use as a strong measure of change in family functioning. As such, the researcher proposes that future researchers engage in longitudinal studies using the SRFI.

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