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The Brief Family Relationship Scale: A Brief Measure of the Relationship Dimension in Family Functioning

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Abstract

The Relationship dimension of the Family Environment Scale (FES; Moos & Moos, 1994), which consists of the Cohesion, Expressiveness, and Conflict subscales, measures a person's perception of the quality of their family relationship functioning. This study investigates an adaptation of the Relationship dimension of the FES for Alaska Native youth. We tested the adapted measure, the Brief Family Relationship Scale (BFRS), for psychometric properties and internal structure with 284 12 to18 year-old predominately Yup'ik Eskimo Alaska Native adolescents from rural, remote communities. This non-Western cultural group is hypothesized to display higher levels of collectivism traditionally organized around an extended kinship family structure. Results demonstrate a subset of the adapted items function satisfactorily, a three-response alternative format provided meaningful information, and the subscale's underlying structure is best described through three distinct first-order factors, organized under one higher order factor. Convergent and discriminant validity of the BFRS was assessed through correlational analysis.

Keywords

Alaska Native; cohesion; expressiveness; conflict; family relationships; family climate

There is need for valid measures of family functioning in research with youth on a number of topics across diverse cultural settings, including family relations, resilience, and protection from substance abuse and psychopathology. We report here on a cultural adaptation of the Relationship dimension of the Family Environment Scale (FES; Moos & Moos, 1994) with a sample of rural Yup'ik Alaska Native youth. The FES has been criticized for low reliabilities when used with youth and people from non-Western cultural backgrounds (e.g., Ma & Leung, 1990; Roosa & Beals, 1990; Sanford, Raymond, & Zucker, 1999). The objectives of this study were to (1) assess the scale structure of the BFRS, (2) investigate the item characteristics of the item pool for their functioning and for optimal response level calibration for Alaska Native youth, and (3) assess the evidence for validity of the BFRS score interpretations.

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Methods

Participants

Participants were 284 Alaska Native 12- to 18-year-olds from rural, remote Alaska communities. Most (194) were recruited from a boarding school in Southeast Alaska, with the remainder coming from a predominately Yup'ik regional hub community in Southwestern Alaska. The sample was 57.7% female and the mean age was 15.5 (*SD*=1.5) years.

Measures

Brief Family Relationship Scale (BFRS)—The BFRS is adapted from the 27-item Relationship dimension of the FES (Moos & Moos, 1994), consisting of Cohesion, Expressiveness, and Conflict subscales (9 items each). These subscales measure support, expression of opinions, and angry conflict within a family.

Validity measures

Communal Mastery Family scale (CMFS; α = .76): The CMFS is a 4-item measure adapted for Alaska Native youth from the 10-item Communal Mastery scale (Jackson, McKenzie, & Hobfoll, 2000), measuring resources provided by the family for coping with stress.

Reasons for Life scale (RFLS; α = .83): The RFLS is a new 13-item scale designed for Alaska Native adolescents, adapted from Osman et al.'s (1996) Brief Reasons for Living-Adolescent scale. The RFLS explores beliefs and experiences that contribute to sense of meaning in life, and is hypothesized inversely related to suicidal ideation.

Youth Community Protective Factors scale (YCPFS; α = .77): The YCPFS is a six-item scale adapted from the Yup'ik Protective Factors scale for adults (Allen et al., 2006). Support and Opportunities subscales tap youth perceptions regarding the extent of these protective factors available to young people in their community.

Alaska Native Cultural Identification scale (ANCIS): Is an eight-item scale adapted from the Orthogonal Cultural Identification scale (Oetting & Beauvais, 1990-1991) that measures home and dominant cultural identification in Alaska Native youth. The ANCIS has two four-item subscales, Alaska Native Cultural Identification (ANCI; α = .77) and White American Cultural Identification (WACI; α = .63).

Procedures

After re-writing items with the assistance of focus groups, we pilot tested and removed poorly functioning items, leaving an 8-item Cohesion subscale, 4-item Expressiveness subscale, and 7-item Conflict subscale, totaling 19 items (see Appendix).

Participants were recruited through active parental consent and youth assent procedures approved by the University of Alaska Fairbanks (UAF) IRB. They were paid $15 for completing measures, which were administered in school computer labs via a secure web server based at UAF. Responses on all measures were via a continuous analog scale with a pointer in the shape of a salmon with three semantic anchors placed below the scale ("*Not at all, Somewhat,*" and "*A lot.*").

Results and Discussion

Prior to analysis, we converted the continuous "slider" scale into 20 intervals, and then grouped the intervals in a manner that approximated a normal distribution: 1-7 = 1, 8-11 = 2, 12-15 = 3, 16-18 = 4, 19-20 = 5. Principal components analysis suggested each subscale was unidimensional.

Objective 1: Assessing the Internal Structure of the BFRS

Comparing undimensional, orthogonal, and second-order three-factor structures (see Figure 1) using essentially tau-equivalent confirmatory factor analysis (CFA) models, we found that the second-order three-factor model fit better than either the unidimensional model, $\Delta\chi^2$ (5) = 150.6 and ΔBIC =122.32, or the first-order three orthogonal factor model, $\Delta\chi^2$ (3) = 335.8 and ΔBIC =318.78 (Graham, 2006; Lee, Dunbar, & Frisbie, 2001). Freeing the item loadings to locate poorly fitting items and items with correlated unique variances led us to eliminate one item from the final scale. The resulting second-order three-factor model was an acceptable fit to the data, χ^2 (132) =261.3, χ^2/df =1.98, GFI=.91, CFI=.93, and RMSEA=. 06.

Objective 2: Evaluate Item Functioning with Alternative Response Scales

We used Samejima's (1996) graded response item response theory (IRT) model, through the *ltm* package in *R* (Rizopoulos, 2006), to examine the relation between responses on the items to the underlying latent construct measured by each subscale. We follow the procedures of Marshall, Orlando, and Jaycox (2002) in reporting the IRT results.

Results of the item parameter estimates showed that the 18 items overall provided satisfactory discrimination. Item 9 provided the highest discrimination index, and item 17 was the least discriminating. Examining the option probability curves led us to recode the data to three options by collapsing options 2-4. The amount of overlap between categories 2 and 4 suggested that these three categories might be providing redundant information. Table 2 reports the IRT results for this three-category calibration, including the discrimination or slope parameter (a), and the location parameters (b_s) for each item.

Location parameter values in Table 2 show that for Cohesion items 1, 12, 14, and Conflict Resolution items 5, 11, 13, endorsing a higher response option for these items occurred at relatively low levels of the latent trait attribute tapped by the subscale, indicating these items provided more information for individuals at low levels of these attributes. To investigate the item information further, we examined the item information functions for each subscale for the three-category calibration. Item 9 provided the greatest amount of information, especially at slightly below and slightly above-average levels, and items 10 and 17 provided the least information. Items 1, 7, 11, and 16 supplied moderate to high information at below or slightly above-average levels. The items that provided low to moderate information across most ranges were items 2, 4, 5, 6, 8, 10, 12, 13, and 18.

Final CFA Results—We then reran the CFA analysis, adjusted to correspond with these IRT findings, testing the 18-item second-order, 3-factor model using 3-category calibration of the rating scale against the original 5-category calibration. The difference in BICs was 31.9, a substantial improvement in fit for the three anchor point calibration (Raftery, 1993). Items 10 and 17 provided little unique information according to the IRT information curves and were removed from the final scale. The improvement in fit after removing items 10 and 17 was significant, $\Delta\chi^2(31) = 64.6$, $p < .01$, ΔBIC = 87.2. The final 16-item second-order three-factor CFA using the three-category calibration was a nearly acceptable fit, χ^2 (101) =164.9, χ^2/df=1.63, GFI=.93, CFI=.95, and RMSEA=.05. Internal consistency of was

acceptable for Cohesion (M=15.73, SD=2.70, α = .83) and Conflict (M=13.06, SD=2.51, α = .80), and for the full scale BFRS (M=34.76, SD=5.53, α = .88), but weaker for Expressiveness (M=5.97, SD=1.47, α = .65).

These internal consistency values were slightly higher than those reported in the manual on the Cohesion and Conflict subscales, and slightly lower on the Expressiveness subscale. The comparatively low internal consistency of the Expressiveness subscale found in this study may stem from poor fit of the construct of expressiveness in this non-Western cultural group. We explored the BFRS with a non-Western North American indigenous cultural group in part because we hypothesized the group was representative of an orientation with alignments towards collectivism (Oyserman, Coon, & Kemmelmeier, 2002), possessing somewhat different values orientations to family relationships. The Expressiveness subscale may not perform as well with this and other non-Western groups, in comparison with mainstream American cultural groups more aligned with individualistic orientations to family functioning. This echoes Ma and Leung's (1990) similar findings of low reliabilities with the Expressiveness subscale in Hong Kong and stated concerns that some items may not have equivalent meaning. Future research will be needed to determine whether the Expressiveness subscale can be adapted for use with non-Western cultural groups.

Objective 3: Convergent and Discriminant Evidence for Validity of BFRS Score Interpretations

The BRFS scores correlated in the expected direction with the CMFS scores (r=.51, p<.01), the RFLS scores (r=.48, p<.01), and the YCPFS scores (r=.44, p<.01) (see Table 3). As expected, the weakest convergent validity correlation, between the BFRS and the YCPFS scores (r = .44), was significantly greater in magnitude than the strongest discriminant validity correlation, between BFRS and ANCI scores (r=.18; t=-4.87, p<.01).

In summary, the BFRS provides an assessment of youth perceptions of family functioning by measuring three aspects of family relationships. In addition to Alaska Native populations, the BFRS may be suitable for use with other American Indian groups, and with other non-Western and collectivist cultural groups, such as individuals from East and South Asian cultures, as well as individuals from Western cultural backgrounds. Further research is needed to test BFRS operating characteristics and to validate the interpretation of scores within these distinct cultural groups.

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Appendix: Brief Family Relationship Scale

Cohesion

1. In our family we really help and support each other.

3. In our family we spend a lot of time doing things together at home.

6. In our family we work hard at what we do in our home.

7. In our family there is a feeling of togetherness.

12. My family members really support each other.

14. I am proud to be a part of our family.

16. In our family we really get along well with each other.

Expressiveness

4. In our family we can talk openly in our home.

8. In our family we sometimes tell each other about our personal problems.

18. In our family we begin discussions easily.

Conflict

2. In our family we argue a lot. (R)

5. In our family we are really mad at each other a lot. (R)

9. In our family we lose our tempers a lot. (R)

11. In our family we often put down each other. (R)

13. My family members sometimes are violent. (R)

19. In our family we raise our voice when we are mad. (R)

Note. Items with (R) are reverse-keyed. Only the final 16 items are shown here. Three items, 10 (In our family we do things for each other without being asked), 15 (In our family we work out our problems), and 17 (In our family we are usually careful about what we say to each other), were removed in the process of our analyses.

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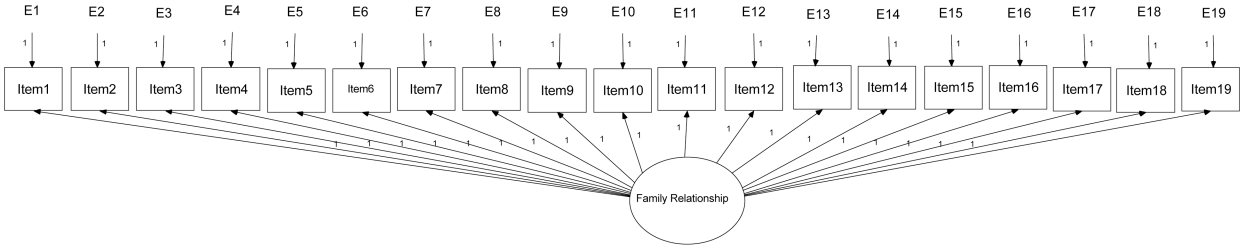
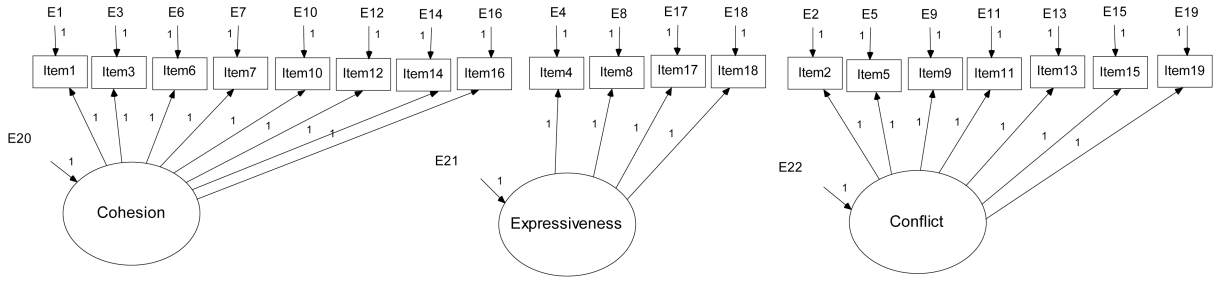
Unidimensional model



First-order three orthogonal factor model



Second-order three-factor model

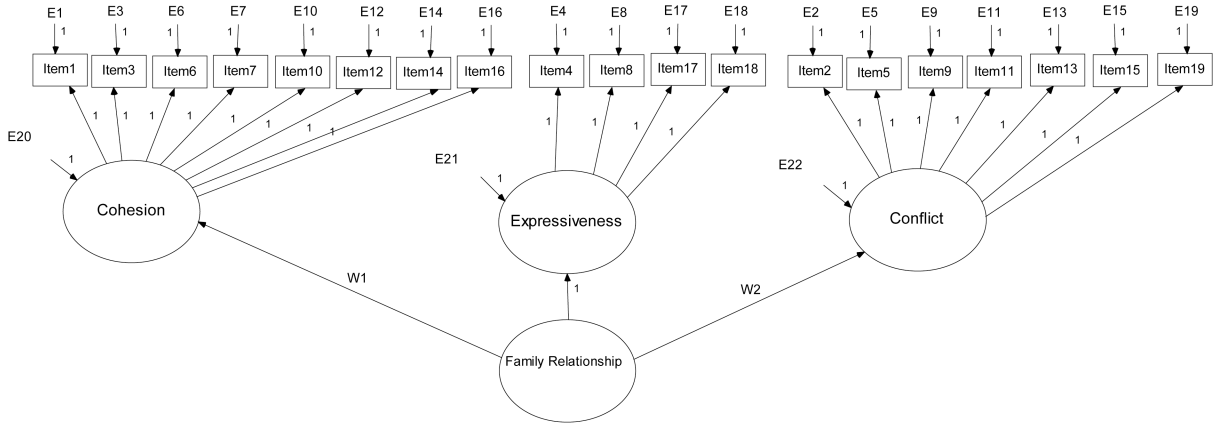


Figure 1.
Confirmatory factor analyses comparison between the unidimensional, first-order three orthogonal factor, and second-order three-factor models.

Table 1

Model Fit Indexes for the Unidimensional, First-Order Three Orthogonal Factor, Second-Order Three-Factor, and Other Models

Model	Number of items	χ^2 (df)	χ^2/df	BIC	GFI	CFI	RMSEA
Unidimensional	19	605.3(170)	3.56	718.28	.78	.79	.10
First-Order Three Orthogonal Factor	19	790.5(168)	4.71	914.74	.78	.70	.11
Second-Order Three-Factor	19	454.7(165)	2.76	595.96	.85	.86	.08
Second-Order Three-Factor Three-Category Calibration	16	164.9(101)	1.63	362.60	.93	.95	.05

Note. CFA = confirmatory factor analysis; BIC = Bayesian information criteria; GFI = graduated fit index, CFI = comparative fit index; RMSEA = root mean square error of approximation

Table 2
Item Parameters for Three-Category Calibration for the 18-Item BFRS

Item	*a*	b_1	b_2
Cohesion			
1	2.20	-2.31	0.34
3	1.56	-1.09	1.84
6	1.74	-2.14	1.16
7	2.90	-1.41	0.85
10	1.27	-1.48	2.12
12	2.06	-2.20	0.43
14	2.35	-2.43	-0.83
16	2.11	-1.77	0.75
Expressiveness			
4	1.67	-1.23	0.92
8	1.88	-1.05	1.28
17	0.70	-2.45	2.29
18	1.71	-1.12	1.38
Conflict			
2	1.57	-1.66	1.57
5	1.88	-2.42	0.39
9	3.91	-1.31	0.69
11	2.11	-1.93	0.25
13	1.56	-2.02	-0.16
19	1.77	-0.57	1.82

Table 3

Correlation among the BFRS Scale, Subscales, and Validity Measures

	1	2	3	4	5	6	7	8	9
1. BFRS									
2. Cohesion	.86**								
3. Expressiveness	.82**	.60**							
4. Conflict[1]	.76**	.55**	.36**						
5. CMFS	.51**	.56**	.39**	.31**					
6. RFLS	.48**	.53**	.34**	.31**	.55**				
7. YCPFS	.44**	.44**	.37**	.26**	.39**	.45**			
8. ANCI	.18**	.26**	.03	.19**	.17**	.30**	.21**		
9. WACI	-.10	-.13*	-.00	-.14*	-.05	-.09	-.02	-.43**	

*p<.05

**p<.01

Note. BFRS=Brief Family Relationship Scale; CMFS = Communal Mastery Family scale; RFLS= Reasons for Life scale; YCPFS= Youth Community Protective Factors scale; ANCI= Alaska Native Cultural Identification; WACI= White American Cultural Identification.

[1]The Conflict subscale score is reverse-keyed, such that a higher Conflict score represents lower conflict in the family, or more positive family relationships.

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