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ABSTRACT

This report provides a basis for understanding the confirmatory factor analysis (CFA) results on the Gender Role Conflict Scale (GRCS) through exploratory factor procedures. Recently, researchers have expanded the available psychometric information on the GRCS through the application of CFA procedures to the hypothesized four-factor model. The four hypothesized factors of the GRCS reflect the four sub-scales of: (1) success, power, and competition; (2) restrictive emotionality; (3) restrictive affectionate behavior between men; and (4) conflict between work and family relations. The study is in two parts. Sample 1 consisted of 198 male undergraduate and graduate students ranging in age from 16-39. The students' ethnicities were White, Asian, Black, Hispanic, and Native American. Sample 2 involved 486 male graduate and undergraduate students ranging in age from 17-48 years. The categories were the same as in sample 1. Participants completed the 37-item, self-reporting GRCS. Results of the exploratory factor analysis provide additional support for the established four-factor model of the GRCS; however, some items can be rewritten to be more pure measures. Claims that the authors and/or users of the GRCS will need to determine if the costs of the revision process will be worth the benefits. (MKA)

Running Head: GENDER ROLE CONFLICT SCALE

The Gender Role Conflict Scale: Enhancing the Interpretation of Confirmatory Factor Analysis Through Follow-up Exploratory Factor Procedures

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Abstract

This article provides a basis for understanding the less than optimal confirmatory factor analysis results on the Gender Role Conflict Scale through exploratory factor procedures.

The Gender Role Conflict Scale: Enhancing the Interpretation of Confirmatory Factor Analysis Through Follow-up Exploratory Factor Procedures

Introduction

The Gender Role Conflict Scale (GRCS; O'Neil, Helms, Gabel, David, & Wrightsman, 1986) continues to appear in the counseling literature as a multidimensional measure of the construct of gender role conflict. O'Neil, Good, and Holms (1995) noted that research in gender role conflict evolved in an attempt to understand how sexism and gender role socialization combine to result in the oppression of males and females. Gender role conflict occurs when the adherence socialized gender roles results in "...personal restriction, devaluation, or violation of others or self." (O'Neil et al., 1995, p. 166-167)

Recently, Good et al. (1995) and Rogers, Abbey-Hines and Rando (1997) have expanded the available psychometric information on the GRCS through the application of confirmatory factor analysis (CFA) procedures to the hypothesized four-factor model (see Figure 1). As indicated in Figure 1, the four hypothesized factors of the GRCS reflect the four sub-scales of "Success Power and Competition, "Restrictive Emotionality", "Restrictive Affectionate Behavior Between Men", and "Conflicts Between Work and Family Relations." Confirmatory factor analysis goodness-of-fit values observed in both the Good et al. and Rogers et al. studies, while approaching recommended cut off values for inferring reasonable fit, suggest a lack of fit of the four-factor model to the data. The purpose of the present analysis is to utilize follow-up

exploratory factor analysis procedures in an attempt to understand the cause for the lack of CFA fit as obtained by Rogers et al. (Table 1).

Method

Participants

The total sample employed in the study consisted of 655 useable GRCS protocols combined from two separate samples of male college students. Sample 1 participants were 198 male college students recruited from a major university located in the mid-eastern region of the United States. The mean age of participants was 21.7 years and ranged from 16 to 39 years. Seventeen percent of the participants were freshman with sophomores comprising 11.2%, and juniors 21.8%. The majority of participants were in their senior year (40.1%) and the remaining 9.6% of participants were graduate students. In terms of racial categories, participants were primarily White (67.5%). Of the remaining participants ,13.3% identified as Asian, 11.7% Black, 2.5% Hispanic, 2.5% Native American, and 2.5% classified themselves as belonging to an unspecified racial group (classified as "Other").

Sample 2 consisted of 486 participants male college students recruited from three universities located in the mid-eastern (1 university) and mid-western (2 universities) regions of the United States. The mean age of participants was 20.1 years with ages ranging from 17 to 48 years. Forty-seven percent of students were freshman, 24.5% were sophomores, 15.2% were juniors, 12.6% were seniors, and .6% were graduate students. Participants were primarily White (77.7%). The remaining participants were defined as 9.9% as Asian, 9.3% as Black, 2.3% as Hispanic, and .8% as Native American.

Instrument

The GRCS (O'Neil et al., 1986) is a 37 item self-report measure utilizing a 6-point Likert response format designed to assess personal dimensions of gender role conflict. The GRCS is scored for four subscales identified through common factor analysis with oblique rotation: Success, Power and Competition; Restricted Emotionality; Restricted Affectionate Behavior Between Men; and Conflicts Between Work and Family Relations. Internal consistency reliability estimates have been reported to range from .74 to .92 for the subscales with average alpha coefficients of .87 .85 .86 and .80, respectively, across 14 studies (Good et al., 1995). Validity estimates of the GRCS have been based on the empirical observation of expected relationships with self-esteem (Sharpe & Heppner, 1991), male gender role attitudes and depression (Good & Mintz, 1990), marital satisfaction (Campbell & Snow, 1992), and help seeking attitudes (Good, Dell, & Mintz, 1989).

Results and Discussion

An exploratory, principal factors, factor analysis was used to examine the underlying structure of the data. Using the Kaiser criterion and scree plot analysis it was determined that four factors best fit the data. This four-factor solution accounted for 97% of the common item variance and 41.46% of the total variance. An oblique rotation (PROMAX) was performed and resulted in the factor pattern presented in Table 2. Employing a minimal factor loading criterion of .40, this pattern, with the exception of items 32 and 14 (with loadings of .39 and .34, respectively), is consistent with the hypothesized model used in the confirmatory procedures.

Alpha coefficients for the current sample were .87, .88, .86, and .79 for Factors 1 through 4, respectively.

Beyond the observation that the exploratory analysis resulted in a pattern that mirrors the four-factor model, we were particularly interested in the size of the cross-loadings of the items. As can be seen in Table 2, there are a number of non-trivial cross-loadings when the items are considered as a set. For example, using a somewhat arbitrary criterion of $\geq .10$ to define non-trivial loadings, 17 GRCS items load on more than one factor. These cross-loadings range from .10 for item 16 to .29 for item 32 with an average loading across the 17 items of .166. The relevance of these non-trivial cross-loadings to the interpretation of the lack of fit through the confirmatory procedures is related to the fact that the CFA model is testing the hypothesis that the off-factor item loadings are zero. That is, the CFA model is overly restrictive in that it forces a perfect simple structure on the data such as is identified in Figure 1. In this model, while the factors are allowed to correlate with one another, the individual items are hypothesized to only load on their identified factors. Resulting goodness-of-fit measures are affected to the extent that this is not true in real-world data. Given that 46% of the GRCS items are affected by this non-trivial cross-loading problem, the observed goodness-of-fit statistics reported by Good et al. (1995) and Rogers et al. (1997) may be interpreted as relatively strong support for the four factor model hypothesized by O'Neil et al. (1986).

In sum, the results of the exploratory factor analysis provide additional support for the established four-factor model of the GRCS when used to inform the Rogers et al. (1997) CFA results. The hypothesized four-factor model appears to be fairly robust when considered from

this perspective. However, in order to improve the model's performance vis-à-vis CFA procedures, non-trivial cross-loading items could be rewritten to be more pure measures of their identified factors and then empirically tested. The authors and/or users of the GRCS will need to determine if the costs of undertaking such a revision process will be worth the benefits.

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Figure Caption

Figure 1. Four-factor measurement model for the GRCS.

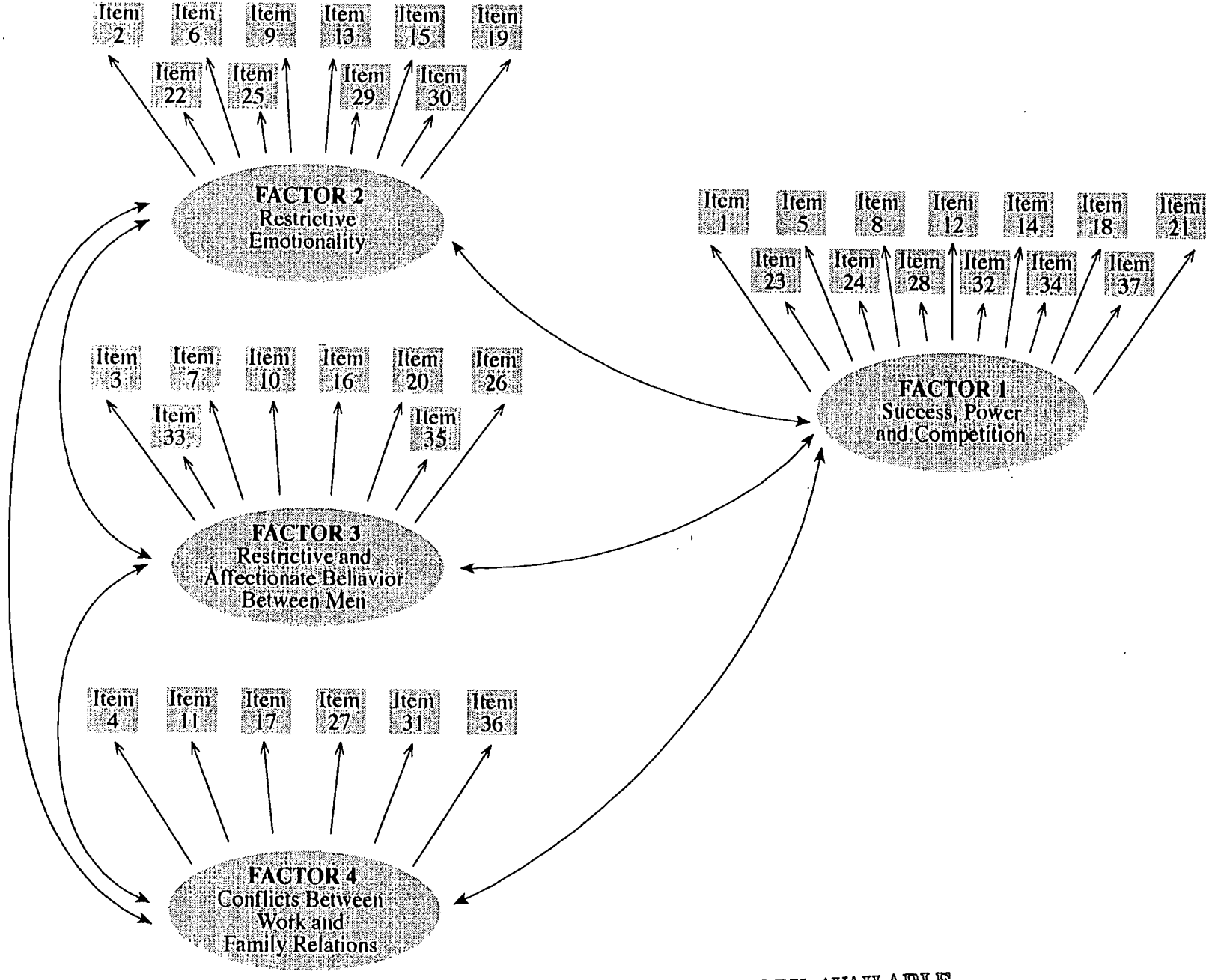

Table 1

Goodness of Fit indices from the Rogers et al. CFA.

Fit Index	Value
Chi-square = 1679.099, df = 623, N = 655	$p < .001$
RMSEA Estimate (90%CI= 0.0480<.0509<.0539)	.0509*
AGFI	.8522**
Tucker-Lewis Fit Index	.8743**
James, Mulaik & Brett Parsimonious Index	.7726***

Note: Non-significant chi square values indicate a good fit to the data (Hatcher, 1993). * RMSEA values $\leq .05$ are recommended to infer close fit (Browne & Cudeck, 1993). **Indicates indices with .90 as recommended cutoff value for inferring model fit (Bentler & Bonett, 1980). ** The recommended cutoff for interpretation of the parsimonious index is .80 (James et al., 1982).

Table 2. Rotated factor pattern.

Items	Factor 1	Factor 2	Factor 3	Factor 4
24	71*	5	1	-9
23	71*	5	-3	-17
28	63*	-15	2	14
34	62*	8	-2	5
36	60*	1	-5	-2
5	59*	-3	1	0
1	58*	-14	1	-2
12	56*	4	1	-1
18	55*	-2	3	-11
8	53*	5	12	6
21	46*	4	0	-1
32	39	8	-2	29
14	34	16	1	24
15	1	80*	-12	4
30	-8	76*	-3	0
19	-1	74*	9	3
13	-6	73*	-4	2
2	-2	71*	-4	-2
6	2	57*	7	0

25	1	52*	10	7
29	8	51*	25	-9
22	9	45*	13	-13
9	7	43*	9	7
33	-6	3	78*	-1
7	-3	-8	78*	2
16	10	-5	71*	-6
20	-6	12	66*	6
3	-7	6	61*	-4
10	8	8	55*	2
26	4	9	52*	4
35	18	1	46*	3
31	-1	-5	-2	78*
27	-5	2	-3	74*
36	3	-3	9	60*
17	-4	2	3	58*
4	-2	2	-1	52*
11	17	1	-5	43*

Note: Values are multiplied by 100 and rounded to the nearest integer. * Indicates values ≥40.

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