A Confirmatory Factor Analysis of Reilly’s Role Overload Scale

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In 1982, Reilly developed a 13-item scale to measure role overload. This scale has been widely used, but most studies did not assess the unidimensionality of the scale. Given the significance of unidimensionality in scale development, the current study reports a confirmatory factor analysis of the 13-item scale in two samples. Based on the results, a 6-item unidimensional scale is recommended. Scores from this scale correlate in predicted fashion with external criterion variables related to role overload.

Keywords: role overload; single parents; confirmatory factor analysis; unidimensionality

In their seminal work on organizational stress, Kahn, Wolfe, Quinn, Snoek, and Rosenthal (1964) conceptualized role overload as a combination of intersender and person-role conflict, wherein the focal person is unable to complete all the tasks expected of him or her by the role senders in his or her role set. Despite the apparent conceptual overlap, role overload and role conflict are distinct role stressors. Kahn et al. (1964) defined sent role conflict as “the simultaneous occurrence of two (or more) sets of pressures such that compliance with one would make more difficult compliance with the other” (p. 19). The focal person experiences role conflict when the role senders in his or her role set have incompatible role expectations of him or her. If the focal person has adequate time and energy to meet these incompatible role pressures, he or she may not perceive role overload. Thus, role overload exists when “the total demands on time and energy associated with the prescribed activities of multiple roles are too great to perform the roles adequately or comfortably” (Voydanoff, 2002, p. 147).

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Based on House and Rizzo’s (1972) role conflict and role ambiguity scales, Reilly (1982) developed a 13-item role overload scale. Reilly (1982, p. 411) and several doctoral students developed an initial item pool. This scale was pretested on a convenience sample of 106 married women. After eliminating items with low item-to-total correlations, the Cronbach’s alpha of the scores obtained from the 13-item role overload scale was .88. Reilly used this scale to study the effect of role overload in working wives’ convenience consumption. While testing a structural model of role overload and convenience consumption in working wives, Reilly (1982, p. 414) allowed the prediction errors for wife’s role overload to correlate with prediction errors for total family income and time-saving durables owned, to achieve a satisfactory fit. In addition, two of the error variances were constrained to zero to prevent the estimation of negative variances.

The scale has been used extensively to measure role overload (Bellizzi & Hite, 1986; Bumpus, Crouter, & McHale, 1999; Crouter, Bumpus, Head, & McHale, 2001; Foxman & Burns, 1987; Kaufman, Lane, & Lindquist, 1991; Maher, Marks, & Grimm, 1997; Marks & MacDermid, 1996). Empirical studies that incorporated the entire 13-item role overload scale have reached contradictory conclusions. For instance, education was found to be both positively related (Bellizzi & Hite, 1986) and inversely related (Kaufman et al., 1991) to role overload. Income was unrelated (Kaufman et al., 1991) to role overload in one study but statistically significantly interacted with role overload to affect consumer choice in another (Assar & Bobinski, 1991). Although Reilly (1982) concluded that the causal relationship between role overload and convenience consumption was nonsignificant, later studies (Bellizzi & Hite, 1986; Madill-Marshall, Heslop, & Duxbury, 1995) found high role overload was associated with convenience consumption.

Foxman and Burns (1987) eliminated two items from Reilly’s (1982) role overload scale due to low item-to-total correlations. Marks and MacDermid (1996) used only 8 of the 13 items of the role overload scale based on factor loadings. Maher et al. (1997) performed a confirmatory factor analysis of a measurement model of role overload using the 13-item role overload scale developed by Reilly. This indicated that the model provided a relatively poor fit to the data. After eliminating items with the poorest fit based on squared multiple correlations, Maher et al. (1997, p. 494) retained only 7 of the original 13 items of Reilly’s role overload scale.

Because of the variation in results obtained from using Reilly’s (1982) model, an examination of the measurement properties of Reilly’s role overload scale is needed. According to Hattie (1985), “one of the most critical and basic assumptions of measurement theory is that a set of items forming an instrument all measure just one thing in common” (p. 139). Gerbing and Anderson (1988) emphasized the need for confirmatory factor analysis to assess the unidimensionality of scales and suggested that “the reliability of the composite score should be assessed after unidimensionality has been acceptably established” (p. 190). Our review of the literature suggests that few studies examined whether Reilly’s (1982) role overload scale measures a single construct (unidimensional).
Although the reliability of the scores obtained from Reilly’s (1982) 13-item role overload scale has been found to be satisfactory, there have been calls for additional research on this scale. Kaufman et al. (1991) used the scale and concluded that “future research is needed to clarify the negative correlation between polychronic time use and role overload that was identified in this research” (p. 398). Rudd (1987) suggested that validation of scores on Reilly’s role overload scale “should receive a high priority” (p. 451). Because the uncritical use of correlated measurement errors to improve model fit has been criticized (Gerbing & Anderson, 1984) and constraining offending variance estimates has been questioned (Fornell, 1983), empirical validation of the unidimensionality of Reilly’s role overload scale is warranted before using the measure for theory testing. The current study addresses this need by means of a confirmatory factor analysis of the scale.

The current study extends past research on role overload by examining the reliability and validity of the scores obtained from Reilly’s (1982) role overload scale in single parents. Single parents are particularly susceptible to role overload because they have to allocate their time and energy to fulfill the multiple obligations of work and family life. One third of children born in the United States today have single parents; the traditional American family of two adults with children at home is projected to make up only 20% of U.S. households by 2010 (Smith, 2004). Consequently, there has been a growing interest in research on single parents on a broad range of issues, such as measuring attitudes toward working single parents (Noble, Eby, Lockwood, & Allen, 2004) and assessing the effects of single-parent family structures on children (Page & Stevens, 2004).

Method

A self-administered questionnaire that was part of a larger study was used to collect data. The questionnaire was pretested on 150 single parents. Of the 136 completed questionnaires, there were 120 usable responses. Respondents were asked to indicate how often they felt role overload by choosing a number between 1 (never) and 7 (always). The items measuring role overload were adapted from Reilly’s (1982) role overload scale. Based on factor analysis and Cronbach’s alpha of the scores obtained from the pretest data, 10 items measuring role overload were used for additional data collection (see the appendix for the items).

The psychometric properties of the scores obtained from Reilly’s (1982) role overload scale were assessed by means of two surveys of a total of 535 single parents in the United States. In the initial study, responses from 154 single parents were analyzed. The findings were validated on a second survey of 381 single parents in the United States. The following sections describe these studies.

Participants

The participants of this study were a national random sample of single parents. Respondents’ single parenthood could have resulted from a variety of reasons, such as...
divorce, separation, or death of a spouse, or they may have never been married. They
were contacted by mail and through the Internet.

**Procedure**

In the initial study, a marketing research firm mailed 4,000 questionnaires to a
national random sample of single parents. A gender-by-product (food and clothing)
stratification was used to randomly select single parents. Half of the outgoing mail
was addressed to single mothers and the other half to single fathers. Respondents were
selected from all states in the United States, including Alaska and Hawaii. A personal-
ized cover letter requesting the individuals to participate in the study was mailed along
with the questionnaire. A prepaid business reply envelope was provided to the respon-
dents for the return of the completed questionnaires.

Of the 4,000 questionnaires mailed out, 193 were returned as undeliverable. A total
of 188 participants returned the completed questionnaire. After eliminating 34 ques-
tionnaires due to missing responses for the variables critical to the study, 154 usable
responses remained for data analysis, resulting in a response rate of 4.05%. A compar-
ison of early and late respondents yielded no statistically significant differences rele-
vant to the study, suggesting that nonresponse bias was not a problem (Armstrong &
Overton, 1977).

In the second survey, a proportionate stratified sampling of the single-parent popu-
lation was used. Single mothers make up 80% of the single parents in the United
States. The same questionnaire was e-mailed to 12,000 single parents in all states in
the United States, including Alaska and Hawaii, in two waves. Eighty percent of the e-mails
were addressed to single mothers and the remaining 20% to single fathers. The first mailing
yielded 230 responses; 2 were unusable, leaving 228 usable responses.

In the second wave, the 230 addresses that responded were removed from the list of
12,000, and 11,770 e-mail questionnaires were sent. This time, 156 single parents
responded. Three of the 156 responses were unusable, leaving 153 usable responses.
Thus, the two waves of e-mails generated a total of 381 usable responses and a response
rate of 3.18%. Similar to Study 1, a comparison of early and late respondents indicated
that nonresponse was unlikely to bias the results of this study (Armstrong & Overton,
1977).

Z tests of proportions revealed that there was no statistically significant difference
between the two samples in the proportions of men and women or in the percentages
of respondents having one child at home. The effect sizes (Cohen’s $d$) of the difference
in age, education, weekly work hours, and role overload scores between the respon-
dents of the mail survey and the e-mail survey were .10, .05, .35, and .35, respectively.
Cell means indicated that the respondents of the e-mail survey worked more hours per
week and perceived more role overload than the respondents of the mail survey, and
the differences were statistically significant.
Sample Representativeness

As stated above, the comparison of the two waves of data collection indicated that there were no statistically significant differences between the two groups on the demographic profiles. These findings certainly support that idea that nonresponses were unlikely to bias the data. Another way of dealing with the representativeness of the sample issue is to compare the profile of respondents to the demographic profile of the population as a whole. Female single parents accounted for 83.5% of the respondents in our study versus 82.56% of the population according to the 2000 census data. Of the respondents, 27.4% had never been married versus 41.57% of the population. Of the population, 36.72% of the population of single parents was divorced as opposed to 52.1% of the respondents. Widows accounted for 4.09% of single parents in the population, whereas they accounted for 6.6% of the respondents. Of the respondents, 29.1% were below the poverty level versus 30.97% of the population. The median income for both the respondents and the population of single parents was slightly less than $30,000 per year. In the population as a whole, 55.77% of the single parents had one child, in comparison to 53.80% of the respondents. Two-children families represented 29.83% of the population of single parents, whereas 29.70% of the respondents had two children. All in all, despite the fact that there are some minor differences between the respondents to our surveys and the national population of single parents, arguably, the sample is highly representative of the single parents in our country.

Results

Confirmatory Factor Analysis

The covariance matrix of the 10 items from the mail survey data was used as the input matrix in LISREL 8.54, and all items were specified to associate with a single factor (role overload). Based on the cutoff values suggested by Hu and Bentler (1999), the fit of this model was unsatisfactory. The chi-square test was statistically significant ($\chi^2 = 131.33, df = 35, p < .001$), and the root mean square error of approximation (RMSEA) was .14. The goodness-of-fit index and the adjusted goodness-of-fit index were less than .95, and modification indices and standardized residuals indicated that the fit of the model could be improved by deleting items.

Based on an inspection of the standardized residuals and modification indices, the model was modified by deleting items. Item 9 was deleted first, followed by Item 2, Item 7, and Item 10 (see the appendix). During this specification search, only one modification was made at a time (MacCallum, 1986), and the fit of the respecified model was evaluated after each modification. The deletion of the four items was the only change made to achieve a satisfactory fit, and unlike Reilly (1982), there were no correlated measurement errors or constrained error variances. The specification search
yielded a 6-item measure of role overload. The standardized path estimates of these 6 items are displayed in Table 1.

As Table 1 indicates, the $t$ value of each of the manifest indicators of role overload was statistically significant. The fit statistics suggested that the data fit the model very well (see Table 1). Consequently, the 6-item role overload scale meets the criterion of unidimensionality.

The data from the e-mail survey were used to cross-validate the six-item role overload scale. The covariance matrix of the six items from the e-mail survey data was input into LISREL 8.54 for a confirmatory factor analysis in which all items associated with a single factor, role overload. The standardized path estimates are displayed in Table 1. The fit indexes exceeded .95, and RMSEA was .05. Thus, the model fit the data very well (Hu & Bentler, 1999). In addition, the $t$ value of the standardized path estimates of each item was statistically significant.

### Descriptive Statistics and Internal Consistency Reliability

The descriptive statistics and the internal consistency reliability (Cronbach’s alpha) were computed separately for both samples. The mean (average across all items), standard deviation, skewness, and kurtosis of the total scores obtained from the six-item role overload scale were 4.14, 1.35, −0.15, and −0.35 for the mail survey data, and 4.60, 1.15, −0.24, and −0.36 for the e-mail survey data, respectively. The Cronbach’s alpha was .89 for the scores obtained from the mail survey and .87 for those of the e-mail survey. Thus, the scores obtained from the six-item role overload scale were reasonably reliable across both samples (Henson, 2001).

<table>
<thead>
<tr>
<th>Item</th>
<th>Mail Survey$^a$</th>
<th>Internet Survey$^b$</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have to do things that I do not really have the time and energy for.</td>
<td>.79 (11.36)</td>
<td>.71 (15.41)</td>
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<tr>
<td>I need more hours in the day to do all the things that are expected of me.</td>
<td>.87 (13.32)</td>
<td>.82 (18.88)</td>
</tr>
<tr>
<td>I cannot ever seem to catch up.</td>
<td>.87 (13.29)</td>
<td>.89 (21.44)</td>
</tr>
<tr>
<td>I do not ever seem to have any time for myself.</td>
<td>.76 (10.77)</td>
<td>.74 (16.26)</td>
</tr>
<tr>
<td>There are times when I cannot meet everyone’s expectations.</td>
<td>.67 (9.14)</td>
<td>.67 (14.11)</td>
</tr>
<tr>
<td>I seem to have more commitments to overcome than other parents I know.</td>
<td>.66 (8.87)</td>
<td>.57 (11.59)</td>
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a. $\chi^2(9) = 6.09$ ($p = .73$); goodness-of-fit index (GFI) = .99; adjusted goodness-of-fit index (AGFI) = .97; normed fit index (NFI) = .99; root mean square residual (RMSR) = .05; root mean square error of approximation (RMSEA) = .00.

b. $\chi^2(9) = 20.47$ ($p = .01$); GFI = .98; AGFI = .96; NFI = .99; RMSR = .05; RMSEA = .05.
Validity

The total scores on role overload (average of the six items) from the e-mail survey data were correlated with the number of children living at home, number of hours worked per week, income, age, and education. Midpoints were used for $10,000 intervals defining income categories. Age and education were measured in years, and workweek length was measured by the hours worked per week. We expected that the perceived role overload of single parents will be related to these demographic variables, as documented in past studies. The correlations are displayed in Table 2.

As Table 2 indicates, the correlations between the scores on role overload and the number of children ($r = .18$) and the scores on role overload and hours worked ($r = .16$) were small and positive. This is consistent with the literature on work-family conflict (Eagle, Icenogle, Maes, & Miles, 1998; Greenhaus & Beutell, 1985; Pleck, Staines, & Lang, 1980). As the number of children and the number of hours at work increase, time available for balancing family and work life shrinks, resulting in increased perception of role overload. The magnitudes and directions of these correlations are comparable to the correlations reported in past studies (e.g., Burns & Foxman, 1989).

As expected, the correlation between the scores on role overload and respondents’ age was negative and small ($r = –.17$; see Table 2). As single parents get older, they are better able to cope with the conflicting demands of work and family life and perceive less role overload. The inverse relationship between age and scores on role overload have been supported in past studies (Bellizzi & Hite, 1986), and Burns and Foxman (1989) reported a small and negative correlation ($r = –.15$) between wife’s age and scores on wife’s role overload.

The correlations between the scores on role overload and both income and education approached zero ($r = –.05$ and $r = –.03$, respectively; see Table 2). Role overload appears to be unrelated to income and education for single parents. The moderately positive correlation between income and education ($r = .33$; see Table 2) suggests that higher levels of education may have enabled single parents to earn more, and the

<table>
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<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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</thead>
<tbody>
<tr>
<td>1. Role overload</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2. Age</td>
<td>–.17</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3. Education</td>
<td>–.03</td>
<td>.25</td>
<td>1.00</td>
<td></td>
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<tr>
<td>4. Income</td>
<td>–.05</td>
<td>.25</td>
<td>.33</td>
<td>.00</td>
<td></td>
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<tr>
<td>5. Hours worked</td>
<td>.16</td>
<td>.09</td>
<td>.13</td>
<td>.32</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>6. Number of children</td>
<td>.18</td>
<td>–.05</td>
<td>–.05</td>
<td>–.01</td>
<td>.01</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Table 2
Correlations Among Role Overload and Demographic Variables ($n = 381$)
resulting increase in buying power allowed them to purchase time-saving goods and services. Thus, as education and income increase, single parents may not perceive so much role overload despite the strains of balancing work and family life. Burns and Foxman (1989) cautioned against the confounding effects of income in studying role overload and did not incorporate income and education as determinants of role overload. Our findings seem to support Kaufman et al.’s (1991) conclusions. However, unlike past studies, we focused exclusively on single parents.

Finally, several scholars have examined gender differences in role stress (Duxbury & Higgins, 1991; Rothbard, 2001). It has been hypothesized that women will experience greater role overload because they receive fewer social and economic resources and rewards than men do (Voydanoff & Donnelly, 1989). As expected, a t test of the difference of mean role overload scores indicated that in the current sample, single mothers perceived greater role overload (4.67) than did single fathers (4.23). The statistical significance of the $t$ value ($t = 2.77, df = 379$) was less than .01, and the effect size (Cohen’s $d$) was .38. Overall, our findings suggest that the scores from the six-item scale are a reliable and valid measure of role overload.

**Discussion**

Researchers have attributed the conceptual confusion surrounding role overload to the lack of consensus on its measurement (Coverman, 1989). Reilly (1982, p. 414) found that role overload is not a significant cause of serving convenience foods and a statistically significant but “weakly positive” cause of the ownership of time-saving durables. Only 6% of the variance in convenience food use and 10% of the variance in ownership of durables was explained by Reilly’s model. Consequently, Reilly concluded that “the major problem is in the amount of variance explained” (p. 416).

Other studies that have used Reilly’s (1982) 13-item role overload scale have also reported findings that are contrary to expectations. For example, Bellizzi and Hite (1986) found that shoppers scoring high on the role overload scale were more interested in the less convenient price-saving shopping style. Because these shoppers were also more interested in purchasing convenience products, the authors concluded that “role overload does not always indicate convenient consumption of either a product or style nature” (p. 8). Rather than questioning the measurement of role overload, Bellizzi and Hite (1986) suggested that other factors such as education, lifestyle, income, and so forth should be considered while examining the effects of role overload on convenience consumption. Kaufman et al. (1991) reported that role-overloaded respondents who are capable of and comfortable in combining activities did not think that a good deal of work can be accomplished over a business lunch. Foxman and Burns (1987) used Reilly’s (1982) scale to measure perceptions of husband and wife role load and concluded that “there is room for further measure purification” (p. 461). Maher et al. (1997) did attempt to purify Reilly’s scale via confirmatory factor analysis. Because the initial model provided a relatively poor fit to the data, Maher et al. (1997) respecified their measurement model of role overload by eliminating items and found
strong support for their proposition that the degree of role overload is positively related to feelings of time pressure.

Our study assessed the unidimensionality of Reilly’s (1982) role overload scale. The results of our study indicate that the scores obtained from a reduced version of Reilly’s scale appear to be a reliable and valid measure of role overload in single parents. Researchers using the 13-item scale should assess the unidimensionality of their measure before using the summated scores for theory testing. As MacCallum (1986) asserted, “Structural model parameter estimates and related information will be more meaningful if the measurement model is free of specification errors” (p. 109).

Appendix

1. I have to do things that I do not really have the time and energy for.
2. There are too many demands on my time.a
3. I need more hours in the day to do all the things that are expected of me.
4. I cannot ever seem to catch up.
5. I do not ever seem to have any time for myself.
6. There are times when I cannot meet everyone’s expectations.
7. Many times I have to cancel commitments.a
8. I seem to have more commitments to overcome than other parents I know.
9. I have to prepare priority lists to get all the things done. Otherwise I forget because I have so much to do.a
10. I feel I have to do things hastily and may be less careful to get everything done.a

a. Items deleted based on confirmatory factor analysis.

References


