Validating a Measure of Work Stress for Correctional Staff: A Structural Equation Modeling Approach

George E. Higgins¹, Richard Tewksbury¹, and Andrew S. Denney¹

Abstract
The purpose of this study is to examine the structure of a measure of work stress. More specifically, the research investigated whether six items properly identified a latent measure of work stress for correctional staff. Using data from a nonrandom sample of correctional staff, the results of the structural equation model analysis supported the view that the six items form one latent construct. The implications of these results are presented as well.

Keywords
stress, structural equation model, corrections, correctional staff

Correctional staff and the stress that has been shown to be inherent in their occupation has been the object of research for approximately three decades, yielding a multitude of insights into the daily stresses in the work lives of correctional staffs. To date, the research on correctional staff stress has led to several themes, with regards to what aspects of their occupation they see as stress inducing, and the link between safety concerns that accompany their occupation and their perceived work stress. This research draws on a number of approaches to conceptualizing and operationalizing the concept(s) of work stress, however. Consequently, the existing literature, while

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largely supporting the idea that correctional staff (especially correctional officers) do experience their jobs as stressful and that interactions with inmates and superior officers/administrators and perceptions of role dissonance are stress inducing is not uniform in what is meant by “stress.” This lack of a common, widely understood and used definition and measurement may mean that the apparent consistency in the literature is in fact not indicative of a cohesive conceptualization.

Although a number of approaches have been used to conceptualize and operationalize “work stress” for correctional employees, there is one fairly commonly used measure, which was originally proposed by Cullen, Link, Wolfe, and Frank (1985). This measure, which was actually one of three subscales of stress assessed, along with measures of job stressors and coping factors, is the most commonly used means for assessing the concept of work stress among correctional officers (and occasionally other types of correctional staff). However, to date there has not been any examination of the psychometric properties of the scale; it has essentially been accepted as valid and reliable. This, however, may be risky for the development of policy and practice; if the literature based on use of this measure in fact does not draw on a valid and reliable measure, policies and practices so developed may be less than ideally useful, or in the worst case, misinformed and contributing to ongoing problems.

The purpose of the present study is to examine the six items from Cullen et al. (1985) to identify the utility of this measure for assessing stress among all varieties of correctional staff, not only correctional officers. Through the use of structural equation modeling (SEM) and with the primary use of confirmatory factor analysis, we seek to contribute to this literature by gaining a more in-depth understanding of the validity of this scale in how it measures correctional staff stress.

To make this contribution, this study begins by providing reviewing the literature on stress-inducing aspects of correctional work. Then, the study outlines the safety concerns that arise in correctional work. Next, the study moves to the need for a standardized and validated measure of correctional staff stress. Then, the methods are outlined that are followed by the results and discussion.

**Stress-Inducing Aspects of Correctional Work**

Stress-inducing aspects of work refer to predetermined structures that are already established and are not within the control of the staff to change. Often such structures are components of the bureaucratic organization of an entity that have been shown to induce stress. Research has also shown that there are a number of stress-inducing aspects inherent in the roles of correctional staff as it functions within the organizational structure. Interestingly, however, these issues are not prominent components in measures (including that of Cullen et al., 1985) of work stress. However, they are important to recognize and understand so as to fully comprehend the dynamics and correlates of correctional staff work stress experiences. These stress-inducing aspects can be divided into two main categories of organizational/administrative issues and role ambiguity that results from structural conditions.
Organizational/administrative issues. The effect that organizational and administrative issues have had on correctional staff and officers has been the subject of a numerous studies. This literature has consistently established that organizational and administrative issues are central contributors to correctional staff work stress (Abraham, 1999; Black, 2001; Cheek & Stefano Miller, 1983; Cullen et al., 1985; Griffin, 2006; Grossi, Keil, & Vito, 1996). Aspects of organizational and administrative issues that contribute to stress include poor communications and a sense that with opportunities for input stress decreases (Lambert, Hogan, & Tucker, 2009), training and communications abilities/styles of organizational leaders (Armstrong & Griffin, 2004). Perceptions of danger on the job, though certainly important, have been shown to be less influential on stress experiences than organization and administrative issues (Armstrong & Griffin, 2004). Similarly, demographic characteristics of staff are also less important for stress experiences than are organizational/administrative issues (Lambert & Paoline, 2008).

Role ambiguity. A second common theme that has emerged with the study of correctional staff and officer stress is the issue of role ambiguity. Role ambiguity refers to employees not fully knowing how to perform the tasks that their job requires with the fault being placed on the organization for not providing effective training and/or resources necessary to carry out tasks related to their job (Cullen et al., 1985; Triplett, Mullins, & Scarborough, 1999; Whitehead & Lindquist, 1986). Black (2001) cites role ambiguity and role conflict as being two primary sources of stress due to staff not wanting to be placed in between satisfying administration officials and the inmates. Lambert et al. (2009) found that correctional staff who are primarily non–custody oriented tend to report higher levels of role-related stress than employees who are mainly custody oriented. Conover (2000) provides a first-hand account of the effects of role ambiguity in his discussion of how even after completing training he continued to feel that he lacked sufficient knowledge to adequately perform his job. Armstrong and Griffin (2004) discuss that the lack of comprehensible guidance from supervisors leads to a significant source of stress for correctional officers, an issue identified by numerous researchers (Cheek & Stefano Miller, 1983; Griffin, 2006; Lambert, Hogan, & Griffin, 2008; Philliber, 1987).

Safety Concerns

In an occupation where one is charged with maintaining living conditions, safety, and the health of nearly 1.6 million state and federal inmates where significant segments have a history of violence, safety concerns with the job are likely to be inevitable for correctional staff (U.S. Department of Labor, Bureau of Justice Statistics, 2010). Wright and Northrup (2001) cite that correctional staff suffer both mentally and physically from stress arising from the demands of sudden physical activity that is required of them in emergency situations due to many individuals being out of shape. In addition, Wright and Northrup also found that correctional staff often resort to destructive measures in order to cope with their stress with smoking, drinking,
unhealthy eating habits, and intrafamily arguments being the most common ways of coping. Uniformed correctional staff report the greatest degree of strain-inducing stress due to physical problems within their work environment, with such contributing to stress experiences more than any other factors (Black, 2001). All correctional employees have been found to have a higher risk than those in other occupations of suffering from heart attacks, ulcers, and high blood pressure issues, which potentially can lead to large numbers of health issues (Whiteacre, 2006). Lambert and Paoline (2008) also note that correctional officers are more likely to die at a younger age compared to the national average, showing some of the potential affects that job-related dangers and stressors have on the mental and physical health of correctional officers (Larzelere & Jones, 2008). The primary reported safety concerns of correctional staff can be divided into two categories of the threat of and/or actual inmate violence, and the effects of understaffing.

**Threat/actual inmate violence.** There are a number of concerns that correctional staff, and perhaps especially correctional officers, report in regards to threats from inmates with the fear of violence attached to it. These include the threat of inmate violence, manipulation by inmates that could lead to corruption of officers, and inmates making a wide range of (both legitimate and illegitimate) demands of the correctional staff and officers (Finn, 1998). Black (2001) discusses that any inmate contact in general is a significant source of stress for correctional staff due to many believing that they have a lack of effective authority over inmates. This finding is supported in the Federal Bureau of Prisons Prison Climate survey that added contact with any inmates as one of the main variables that are associated with higher levels of employee stress (Whiteacre, 2006). Some researchers have noted that the persistent threat of inmate violence stems from the fact that inmates are receiving longer sentences, resulting in less incentive for good behavior (Finn, 1998). Perceived work dangers in the form of inmate threats of violence have been shown to have a significant and strong negative effect on work satisfaction (Cullen et al., 1985). Negative inmate contact has been shown to significantly increase the likelihood of job burnout, which has also been documented as a result of occupational stress (Morgan, Van Haveren, & Pearson, 2002). Wells, Minor, Angel, Matz, and Amato (2008) reported that juvenile correctional staff stress predictors can be entirely found within the work environment with danger being the primary issue of stress reported. It is not just the reality of threats and violence that are important though; Huckabee (1992) contends that how dangerous correctional officers perceive the inmate population with which they work is a significant contributor to reported levels of stress. This is supported by Wells et al. where they discuss that any perceived threats to correctional staff safety in a juvenile facility directly contributed to reported levels of job stress.

Data on inmate on staff violence are only minimally available, however. From 1990 to 1995 assaults against correctional officers in both state and federal prisons climbed from 10,731 incidents per year to 14,165, suggesting an almost 33% increase in assaults (Finn, 2000).
officers employed both state and federally (Finn, 2000). In accordance with these findings, the Bureau of Labor Statistics states that correctional officers have one of the highest rates of workplace injuries of any occupation in the United States (U.S. Department of Labor, Bureau of Justice Statistics, 2010). Some estimates, such as those provided in *The Corrections Yearbook* (2002), suggest that as many as 33,000 inmate-on-staff attacks occur annually in state prisons.

**Effects of understaffing.** The effects of understaffing have also been shown to create a number of negative effects on correctional staff and officers. The main reason for this is that a shortage of correctional staff leads to a shortage of posts being filled, thus creating a more dangerous workplace due to higher ratios of inmates-to-staff (Finn, 1998). Another reason for the shortage of correctional staff and officers is a high rate of turnover resulting from many correctional staff, especially correctional officers, quitting shortly after being hired (Gibbons & Katzenbach, 2006).

As a result of understaffing, many correctional officers express that they fear corruption among authority and their coworkers, which has been shown to positively correlate with stress (Farkas, 1999; Finn, 1998). This is a characteristic that can have significant effects due to the fact of an institution already being perceived as a dangerous workplace, and now it is coupled with the sentiment that those few employees available who are entrusted with one’s protection in a serious event may not able to be trusted.

Due to a general shortage of correctional staff and officers in many facilities, many employees are forced to work mandatory overtime (Finn, 1998; Kauffman, 1988). The consequences of mandatory (often unanticipated) overtime are many and includes officers often ignoring phone calls from the prison when they are at home since they presume they are calling them in to work or even having multiple telephone numbers to avoid being called into work (Finn, 1998). Shortages of correctional officers has also resulted in correctional facilities using creative and unique shift work structures in order to cover necessary posts essential to the operation of the prison (Finn, 1998). There have been a number of issues documented as a result of shift work being that of cognitive impairment, fatigue, lack of vigilance, and decreases in motor skills due to the disruption of the biological clock from the lack of the body being on a normal schedule (Swenson, Waseleski, & Hartl, 2008). Vigilance is also commonly recognized as among the most important characteristics that a correctional officer can exercise to promote a safe working environment; its absence can further lead to an unsafe work environment (Blakely, 1996). Correctional staff have been found to be dissatisfied with their occupation, with 54% reporting that they feel that their career was at a standstill. Dissatisfaction is also frequently connected with working night shifts, which are seen as limiting opportunities for recognition and advancement (Whiteacre, 2006). Whiteacre also found that overall occupational stress and satisfaction were two of the main factors that influence staff reliability, truancy, and turnover in correctional staff, thereby suggesting that factors contributing to stress and stress experiences are mutually reinforcing experiences.
The Need for a Standardized, Validated Measure of Correctional Staff Stress

Due to the multitude of studies documenting and analyzing high levels of stress among correctional employees and officers and the potential devastating organizational and health effects that this can have on all involved, it is vital to have a both standardized and validated way of measuring correctional staff and officer stress. Throughout the literature on correctional staff stress, there exists a vast array of different ways to measure correctional staff stress, although most measures are specifically focused on correctional officers. Among the most frequently used means of assessing correctional officer stress is some variation of the work stress subscale derived from Cullen et al.’s (1985) 57-question Likert-type scale instrument. More specifically, their 57-question instrument, composed of multiple scales, is intended to measure the following: work stress, job dissatisfaction, dangerousness, role problems, supervisory support, peer support, family support, community support, correctional orientation, and overall life satisfaction. As discussed below, there are numerous scholars who have used some aspects of their scales, which researchers have used to measure correctional staff and officer stress. However, without a standardized means of assessing stress it remains difficult to compare studies’ results and subsequently develop and implement policy and prevention and intervention responses.

A review of the 83 identified, published studies citing Cullen et al. (1985) shows that 68 of the articles citing the study use definitions and/or only cite findings from Cullen et al. More important, 15 studies either use the same exact measure of work stress, or borrow selected items, from those originally put forth by Cullen et al. More important, a few scholars using this scale report internal consistency statistics via Cronbach’s alpha. Cronbach’s alpha is a measure of homogeneity of the items (Nunnally & Bernstein, 1994). This test provides information of internal consistency and, consequently, a measure of reliability—especially in cross-sectional data. Cronbach’s alpha is not able to provide information about the structure or validity of the any measure. This is the case because Cronbach’s alpha only provides a standardized examination of the correlation among the measures rather than using the correlation to determine whether the structure of the measure can be viewed or is as hypothesized. In other words, this is an inadequate test of validity of a measure but is a suitable test of reliability. Applied to the present study, the research that only uses Cronbach’s alpha does not provide validity information or information about the structure of the items but only reliability information. To date, no past work has specifically examined whether the scale in fact measures one unified concept.

Of the studies that do use the Cullen et al.’s (1985) work stress measure, few look at the scale as a conceptual entity and examine its construction. Only one study (Dial, Downey, & Goodlin, 2010) do any psychometric assessment of the Cullen et al.’s work stress scale—they use principle components factor analysis (i.e., exploratory factor analysis) so as to standardize scores on the scale across respondents. Exploratory
factor analysis is a statistical test that is often used to determine whether items form a structure (Kline, 2004). This means that researchers use data to find a structure among the items and that a structure of the items is not imposed before the data are analyzed. This does provide some information about which items hang together, but it does not adequately test the structure of the items.

An alternative is to examine the structure of the items using SEM. When researchers use SEM, they are required to state their hypotheses, structure of the items, a priori. This means that the researcher is testing the validity of the measure by examining the structure of the measure. To do this, Kline (2004) suggests using confirmatory factor analysis (CFA). CFA is a form of SEM that allows researchers to determine the importance of each item in the structure of the measure (i.e., the size of the factor loading) and the fit between the hypothesized model and the covariances that are observed in the data. To date, no study in the literature has examined the structure of the items using SEM.

**The Present Study**

The purpose of the present study is to examine the structure of Cullen et al.’s (1985) work stress measure for correctional staff. Specifically, we examine whether the six items from this measure come together to indicate work stress (see Figure 1). To do this, we use CFA via SEM. This study offers a richer understanding of Cullen et al.’s work stress measure. Furthermore, this study examines whether this version of work stress may be properly used with correctional staff.
Method

Procedures and Sample

The data for the present study come from self-administered surveys of all correctional staff at two medium-security prisons in Kentucky. All of the correctional staff members who have their primary appointment in one of the two institutions received an explanatory cover letter and the survey along with their paychecks in the spring 2004. The cover letter explained that participation in the survey was voluntary, and the letter informed the correctional staff that their responses would be confidential and anonymous. The cover letter, and the survey, instructed the correctional staff to return the surveys in one of the locked collection boxes that was located inside the main entrance for each institution. The locked collection boxes were kept in place for 2 weeks. To improve the number of completed surveys, the wardens at each institution assisted with data collection by sending either written or email encouragement and reminders to the correctional staff to complete the survey.

These procedures resulted in a sample of 228 correctional staff members returning completed surveys from the 650 that were distributed; thus, the response rate was 35%. The sample consisted of 68.1% male participants, their average age was 42.5 years and had an average of 9 years and 2 months experience working in corrections. Another 33% of the participants had at least a college education. Furthermore, 34.5% worked in programs (i.e., unit management, education, chapel, and industries), 23.3% worked in security (i.e., correctional officer or supervisor), 19.5% worked in either medical or mental health services, 10.7% worked in administration, 7.1% worked in support services, and 4.9% worked in classification, unit management, or other.1

Measures

The measurement for this study was based on the six items derived from Cullen et al.’s (1985) work stress scale. Cullen et al. designed the scale to examine how anxious or pressured officers felt while they were on duty. The items are as follows: “When I’m at work, I often feel tense or uptight” (W1); “A lot of the times, my job makes me very frustrated or angry” (W2); “Most of the time when I am at work, I don’t feel that I have much to worry about” (W3); “I am usually calm and at ease when I am working” (W4); “I usually feel that I am under a lot of pressure when I am at work” (W5); “There are a lot of aspects about my job that can make me pretty upset about things” (W6). Correctional staff marked their responses to these six items using a 5-point Likert-type scale that was anchored by 1 = strongly disagree to 5 = strongly agree. Higher scores on the scale indicated higher levels of work stress.

Analysis Plan

The analysis plan for this study takes place in a series of steps. The first step is a presentation of the descriptive statistics for the items. This includes the means, skewness,
and kurtosis to determine the normality of these data. The second step is a presentation of the bivariate correlations to determine how much variance the measures share. The third step is a presentation of the CFA via SEM. CFA is a statistical technique that allows for a hypothesized structure among measures to be tested. CFA is different from exploratory factor analysis (EFA) because the hypothesized structure is presented prior to data collection and analysis. CFA is operationalized using SEM software. In the present study, Mplus version 6.1 was used to perform the CFA.

When evaluating CFA for success or failure and quality, the fit statistics are important as well as the size of the factor loadings (Kline, 2004). Our evaluation of the CFA, in this study, began with model fit. Model fit is examined to determine whether the hypothesized model fits the data. To determine whether this is the case, we followed Hu and Bentler’s (1999) guidelines. Their guidelines are that the chi-square should be nonsignificant, the comparative fit index (CFI) should be 0.95 or above, the root-mean squared error of approximation (RMSEA) should be 0.08 or below, and the standardized root mean of the residual (SRMR) should be 0.05 or below. The SEM calculates these fit statistics, and we will use them to determine proper model fit. Kline argued that factor loadings should be large when performing CFA, and his standard of large factor loadings is 0.50 for standardized factor loadings. We use this to determine whether the factor loadings are large for our sample.

The fourth step of the analysis is a presentation of a Monte Carlo simulation to learn more about the data. The simulation provides information about the bias in the estimates and standard errors. Muthen and Muthen (2002) argued that bias that is less than 10% for the estimates and standard errors was an indication that the estimates were stable. In addition, the simulation provides information about statistical power. This is a final check to make sure that the sample was large enough to arrive at these results.

**Results**

**Step 1**

The first step is a presentation of the descriptive statistics. Table 1 shows the means for all of the measures indicate agreement with the statements except for one. The statement, “Most of the time when I am at work, I don’t feel that I have much to worry about,” has a mean response that indicates disagree. This could be because the staffs are cognizant of the potential danger that may lurk in correctional facilities. In addition to the means, all of the measures do not appear to be overly skewed or kurtotic, indicating that they have a relative normal distribution.

**Step 2**

Table 2 presents the bivariate correlations for these measures. All of the correlations are significant, indicating that the measures do share variance and associate. In addition, the correlations indicate that all of the associations are positive and large with
the exception of one correlation—“Most of the time when I am at work, I don’t feel that I have much to worry about,” and “I usually feel that I am under a lot of pressure when I am at work”—have a weak correlation ($r = .18$). This suggests that these two measures may not associate very well. Overall, the correlations are in the expected direction and are supportive of Cullen et al.’s (1985) idea that these items capture work stress.

**Step 3**

Table 3 presents the confirmatory factor analysis via structural equation modeling. The first part of this analysis is the model fit. The chi-square is statistically significant. Although Kline (2004) argued that this should not be significant, he also argued that a sample that has more than 200 observations is likely to have a significant
chi-square statistic and other fit statistics must be consulted. The CFI is 0.97, RMSEA is 0.08, and the SRMR is 0.04, and all these fit statistics indicate that the model does fit the data. The next part of the analysis is to determine whether the factor loadings are large. Table 2 shows that all of the factor loadings are above Kline’s standard of large factor loadings, except one. The factor loading for the item, “Most of the time when I am at work, I don’t feel that I have much to worry about,” is 0.36, suggesting that it is not a large factor loading. This is consistent with the correlation coefficient that suggests that it is a weak measure. We attempted to confirm the model without the measure, but the model no longer fit the data; thus, using correctional staff we were able to confirm that Cullen et al.’s (1985) measure of work stress is a single factor.

### Step 4

To learn more about our data, we performed a Monte Carlo simulation study. This study was designed to recover our model—testing for bias in factor loadings and standard errors—and to determine whether a larger sample would change the size of the factor loadings. Our study was carried out using 1,000 replications. First, we were able to recover our model with minimal bias to the factor loadings and their standard errors. The results indicated that we had sufficient statistical power for this analysis. Second, we examined whether changes in sample size would change the factor loadings. We examined 300, 500, and 1,000 as possible options. Our results indicated that it would take a sample of 1,000 to substantively change the size of the factor loadings. Overall, this additional work shows that our results are stable and replicable.

### Table 3. Confirmatory Factor Analysis.

<table>
<thead>
<tr>
<th>Measures</th>
<th>Factor loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. When I’m at work, I often feel tense or uptight (W1)</td>
<td>0.62*</td>
</tr>
<tr>
<td>2. A lot of the times, my job makes me very frustrated or angry (W2)</td>
<td>0.69*</td>
</tr>
<tr>
<td>3. Most of the time when I am at work, I don’t feel that I have much to worry about (W3)</td>
<td>0.36*</td>
</tr>
<tr>
<td>4. I am usually calm and at ease when I am working (W4)</td>
<td>0.75*</td>
</tr>
<tr>
<td>5. I usually feel that I am under a lot of pressure when I am at work (W5)</td>
<td>0.74*</td>
</tr>
<tr>
<td>6. There are a lot of aspects about my job that can make me pretty upset about things (W6)</td>
<td>0.71*</td>
</tr>
</tbody>
</table>

Chi-square = 22.40*

CFI = 0.97

RMSEA = 0.08

SRMR = 0.04

Note. CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean of the residual.

*p = .05.
**Discussion**

This study tested the factor structure of Cullen et al.'s (1985) work stress measure with a sample of correctional staff. Cullen et al. argued that six items formed a one-factor model. This model demonstrated excellent fit and offered strong fit indices. The proper fit of the model to the data indicates that the model has discriminant validity, and the large factor loadings indicate that convergent validity has been found in these data. In dealing with correctional staff, it appears that the Cullen et al.’s scale is appropriate. In fact, the brevity of this scale may be an advantage in decreasing completion time and increasing completion rates.

The Cullen et al.’s (1985) measure contains items that seem to capture several important parts of the stress literature (e.g., see Agnew, 1992, 2001). In particular, the measure contains items about tension, frustration or anger, worry, calmness, pressure, and being upset. Though brief, the items allow for an argument to be made that the measure is tapping into several parts of the stress concept; thus, the measure provides a broad perspective of stress. Most important, the scale provides ample data to understand stress among correctional staff.

The fact that more than 80 studies have examined the issue of work stress in a correctional setting suggests the importance of the need to study work stress in a correctional setting. Correctional facilities and organizations have devoted a substantial amount of resources to better understand how to reduce instances of work stress. Until this study, the measurement that informs these facilities and organizations is suspect. In other words, this study allows correctional facilities and organizations to better understand the work stress that is taking place. This may lead to a better development of policy within these organizations.

The validity of the scale needs to be kept within the confines of the study’s limits. First, the sample for the study is small and nonrandom, but our simulation study that we performed to replicate the findings—described in Note 2—shows that the sample used in this study is of adequate size. Second, some may object to us taking an approach that is devoid of theory. Our perspective is that the measure may be used to measure stress under several different theoretical traditions. To name only a few, researchers that may use Agnew’s (1992) version of strain or Lazarus and Folkman’s (1984) version of stress may find this measure useful. In other words, this measure of stress may be useful for multiple theoretical orientations to understand correctional staff stress. Third, a longitudinal data set may be useful in understanding the structural changes in the measure over time. Our study does not address this issue, but future research may undertake this focus.

Despite the limits of this study, our study contributes to the literature by examining the structure of Cullen et al.’s (1985) work stress measure. Specifically, the results indicate that the six items create one latent measure of work stress. Future studies that use larger random samples that are longitudinal and that may be theoretically driven may provide more information, but, for now, the current measure of Cullen et al. appears to have validity to understand work stress for correctional staff.
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Note

1. The manner in which our data were collected does not allow for disaggregating into clerical staff, correctional officers, or correctional supervisors.

References


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