1-1-2018

# Development and Validation of a Career Resilience Scale for Adults with Disabilities

Eric Suedmeyer

DEVELOPMENT AND VALIDATION OF A CAREER RESILIENCE SCALE FOR
ADULTS WITH DISABILITIES

by

Eric Suedmeyer

A Dissertation

Submitted in Partial Fulfillment of the

Requirements of the Degree of

Doctory of Philosophy

Major: Counseling Psychology

The University of Memphis

August 2018

Dedication

This work is dedicated to my loving family, friends, and professors who supported me

every step of the way.

Acknowledgments

Abstract

Adults with disabilities face multiple internal, social, and systemic barriers that hamper efforts to attain and maintain meaningful employment. In order to achieve success in vocational pursuits, individuals with disabilities must demonstrate perseverance in the face of probable adversity; this construct is *career resilience*. No scale has been developed to measure a person's career resilience that is specifically tailored to people with disabilities. The purpose of this study was to develop an instrument to measure the career resilience of adults with disabilities. After creating the Career Resilience for Adults with Disabilities Scale (CRADS), two studies were conducted to evaluate the scale. Study 1 used an Exploratory Factor Analysis (EFA) to determine the CRADS structure. Study 2 focused on establishing validity and reliability for the CRADS. EFA supported a three-factor taxonomy for the CRADS. Coefficient alphas for the three subscales ranged .71 - .79 with the full-scale coefficient alpha being .84. Differences in CRADS scores were found between adults with disabilities who were currently employed and those unemployed and not actively looking for work, suggesting the scale's utility to discriminate between groups with high and low career resilience. The CRADS is a brief, self-report measure of career resilience with sound psychometric properties for early research in the domain of career resilience for adults with disabilities.

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## Introduction

Leo Kanner (1942) argued that people with disabilities experience a double disability: the limitations caused by their biological malformations and the limitations caused by negative social attitudes toward them. Historically, adults with disabilities have faced multiple challenges in pursuit of desirable employment outcomes. Social and systemic barriers impede people with disabilities from attaining competitive pay and work hours necessary to keep themselves above poverty (Butterworth et al., 2012; Callahan, Griffin, & Hammis, 2011; U.S. Bureau of Labor Statistics, 2017).

The federal government has invested billions of dollars to address this economic disparity, beginning in secondary education and extending across the lifespan (Hernandez et al., 2007; Siperstein et al., 2014). The Americans with Disabilities Act (ADA; 1990) expanded the rights laid out by the Rehabilitation Act of 1973 by prohibiting discrimination in employment in state and local governments and employers who oversee fifteen or more employees. However, the stigma of disability, along with a diminished capacity to generate and utilize social capital, further inhibit disabled individuals' efforts to achieve economic independence (Callahan et al., 2011; Martz, Schiro-Geist, Broadbent, & Crandall, 2010).

Following a long history of developing civil rights and legal protection to work for people with disabilities, there are now several options for adults with disabilities to find employment and support. These opportunities are not equal, however, and there is additional necessary legal and social development before this marginalized population attains economic equality. Currently, employment rates for adults with disabilities who recently completed high school hovers at around 17.9%, substantially lower than the

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65.3% employment rate of same-aged peers without disabilities (U.S. Bureau of Labor Statistics, 2017). Employed adults with disabilities are likely to receive fewer benefits as part of their employment, including reduced or no sick leave, vacation time, or retirement benefits (Wagner, Newman, Cameto, Garza, & Levine, 2005). These hardships suggest that, in order for career-oriented adults with disabilities to succeed in their vocational goals, they need to be resilient, by demonstrating qualities that allow them to succeed in employment when faced of adversity. This form of resilience, known as career resilience, can be an important contributor to career success (Kodama, 2017; Moorhouse & Caltabiano, 2007). The potential for the construct of career resilience to benefit the lives of people with disabilities is substantial and should be investigated further. Therefore, the purpose of this study was to develop a valid and reliable instrument for measuring career resilience for people with disabilities.

**Adults with Disabilities and Employment**

The Americans with Disabilities Act (ADA, 1990) defines disability as "a physical or mental impairment that substantially limits one or more of the major life activities of the individual" (Sec. 3). These impairments manifest in multiple negative ways. Functional impairment exhibited by people with disabilities can cause substantial problematic independent living situations that lead to revocation of autonomy and legal agency in the case of severe deficits (Kohn, Blumenthal, & Campbell, 2013). Individuals with disabilities report a greater reliance on support from others (LeRoy, Walsh, Kulik, & Rooney, 2004). Stigmatization has been shown to increase feelings of depression and anxiety (Cummins & Lau, 2003). People with disabilities also report feelings of being treated with disrespect, failures of coworkers and employers to make reasonable

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adjustments, and refusal for services when utilizing businesses, despite legislation

outlawing discrimination (Stalker & Lerpiniere, 2009).

Adults with disabilities also experience more challenges in attaining and

maintaining employment. Despite an overwhelmingly positive perspective that customers

have toward companies who hire people with disabilities (Siperstein, Romano, Mohler, &

Parker, 2006), employers still express significant hesitation in hiring people with

disabilities (Ju, Roberts, & Zhang, 2013). Some employers fear individuals with

disabilities will not be able to perform their job up to the employer's standards

(Graffman, Shinkfield, Smith, & Polzin, 2002), whereas industries that involve

significant manual labor such as construction, warehousing, and manufacturing are more

likely to identify health insurance costs as a major challenge to hiring individuals with

disabilities (Houtenville & Kalargyrou, 2015). For these reasons, many employees with

disabilities feel the need to try and hide the extent of their impairment or are reluctant to

make requests for legally required accommodations (Freedman & Fesko, 1996). Wagner

and colleagues (2005) found that only 4% of employees with disabilities had

accommodations in the workplace, despite qualifying for them, and many did not disclose

their disability to their employer at all. Adults with disabilities also endorse more

difficulties with job requirements and transportation problems (Milner et al., 2015).

Despite this Olson, Cioffi, Yovanoff, and Mank (2001) found that when employers do

hire individuals with disabilities, the employers generally report positive employment

satisfaction, noting that additional concerns such as insurance and specific

accommodation costs were the same as employees without disabilities. They also

reported that their employees with disabilities were competent workers. A key variable

that may contribute to why some employees with disabilities succeed and thrive in the workplace may be their career resilience.

**Resilience Theory**

Generally, resilience is defined as "good outcomes in spite of serious threats to adaptation or development" (Masten, 2001, p. 228). Resilience theory developed in response to observations of children obtaining positive outcomes despite adverse developmental circumstances (Masten, Best, & Garmezy, 1990; Werner & Smith, 1982). These at-risk conditions (e.g., low SES, low birth weight, biological family-history risk factors, low maternal education) often correlate with negative developmental outcomes. Many of these risk factors are identified after exposure to the factor during periods of developmental receptivity or vulnerability. When multiple risk factors co-occur, it creates a compound, or cumulative risk. Resilience theory focuses on two key concepts, the impact of risks (-) and benefits of assets and resources (+) on the individual's functionality (Masten, 2001; Smith, 2006). These resources can be seen as internal psychological characteristics that promote perseverance and success such as optimism and self-efficacy, as well as the ability to utilize external resources such as one's social network (Luthans, Vogelgesang, & Lester, 2006).

The concept of career resilience utilizes the resilience model as applied to vocational goals, and buffers individuals from career related stressors and barriers (Kodama, 2017; Moorhouse & Caltabiano, 2007). Rehabilitation counselors can also intervene to promote clients' career resilience. The findings by Luthans et al. (2006) support the utilization of career interventions and training to boost career resilience. For persons with disabilities, psychological resilience is necessary when functioning within a

setting in which they expect to experience stigma due to their disabilities (Green, 2007). Given the vocational difficulties faced by people with disabilities, assessing their career-related resilience is vitally important for several reasons. Career resilience has been shown to be an important mediator between an individual's personality, career self-evaluation, and career satisfaction (Lyons, Schweitzer, & Ng, 2015). It can protect a person's psychological well-being from disappointment at work (Kodama, 2017), and help prevent burnout for early career professionals (Johnson et al., 2014). If individuals with disabilities' career resilience is effectively supported, they may also see the benefits that this emerging area of research of career-resilience has demonstrated for other populations. But first, researchers and clinical providers need a means of measuring career resilience with the group.

**Current Measures**

Common measures in resilience research such as the Connor Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003) and the Brief Resilience Scale (BRS; Smith et al., 2008) have a limited or undisclosed pool of individuals with disabilities in their norming population. For instance, the CD-RISC utilizes two samples of individuals with psychiatric disabilities, but the authors did not report the presence of any other forms of disabilities in their study. The authors of the BRS did not report the presence of disabilities in their samples at all. These two scales are also limited in the scope of their item content, focusing primarily on internal factors of resilience such as one's persistence, optimism, and hope, ignoring one's ability to utilize external resources to recover from stressful events. Lastly, these measures are focused on general resilience,

and their utility in measuring one's ability to persevere through work related stress is unknown.

Regarding the measurement of career resilience specifically, the Career Resilience subscale of the Career Commitment Measure (CCM; Carson & Bedeian, 1994) suffers from several of the same criticisms. The authors did not report disability status of their norming sample. Their measure is also based on congruent item content analysis resulting from their factor loading of an exploratory factor analysis, rather than being grounded in a resilience theory. Lastly, its small size (four items) and use of entirely reverse worded items likely limits its variability and reliability.

Given the lack of an instrument to validly and reliably assess career resilience in individual with disabilities, the purpose of this study was to develop the Career Resilience for Adults with Disabilities Scale (CRADS). The CRADS was specifically designed to assess the ability for people with disabilities to attain positive vocational outcomes despite documented work-related difficulties. Other measures of resilience and career resilience currently exist, but none were designed to achieve this goal for this population. Therefore, two studies were conducted for the purpose of designing and evaluating the proposed CRADS.

## Study 1

The purpose of Study 1 was to create an item pool and to determine the factor sturcutre a measure of career resilience for adults with disabilities. The study was designed to answer the following research question:

- RQ1: What is the factor structure of the CRADS as suggested by a development sample?

**Method**

**Participants and Procedure**

An item pool was generated for the Pilot-Career Resilience for Adults with Disabilities Scale (P-CRADS) using Luthar and colleagues' (2006) definition of resilience. All items were generated by the authors. Internal resilience items focused on an individual's coping and self-efficacy at overcoming career hardships. A sample item would be "I keep working even if my job gets hard." External resources items focused on a person's desire to utilize social capital to cope with work difficulties. A sample item would be "I can go to my coworkers for help." The pool of 31 items was reviewed by six subject matter experts (SMEs) with either research experience with vocational rehabilitation or resilience, or practical experience in Vocational Rehabilitation. The SMEs were provided with the study's operational definition of the career resilience construct. The SMEs were then asked to rate items from 1 (not relevant at all) to 4 (highly relevant). An item content validity index (I-CVI) was calculated based on the proportion of raters who rated item relevance as either 3 or 4. For the six SMEs, the minimum acceptable I-CVI value for retention was .83 to reduce likelihood of chance agreement, and thus was the criterion for retaining an item (Polit & Beck, 2006; Polit, Beck, & Owen, 2007). Five items were removed for failing to meet this criterion. A scale content validity index (S-CVI) was also calculated based on averaging of the retained items' I-CVI. The S-CVI criterion was met for both the Internal Resources (.93) subscale and the External Resources (.94) subscale, as well as the composite Career Resilience (.93) scale. Twenty six items met expert review criteria were retained for further analysis as the pilot-CRADS.

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Following the expert review, participants were recruited for the exploratory factor analysis. The samples were all recruited from Tennessee State Vocational Rehabilitation, Tennessee Higher Education Alliance, and social networking sites focused on people with disabilities (e.g., disability focused forums on Reddit.com, National Association of Injured and Disabled workers forums) due to social networking's effectiveness at recruiting hard-to-reach populations (King, O'Rourke, & DeLongis, 2014). Participants recruited through Tennessee State Vocational Rehabilitation and the Tennessee Higher Education Alliance completed hard-copy "pen and paper" versions of the survey, whereas participants recruited through social networking completed an online version. All participants who met the desired recruitment criteria (i.e., adults with disabilities who can read and understand English) were compensated for their time with a $15 Amazon.com gift card. Compensation was only mailed to respondents, with up no repeated addresses in order to prevent repeat respondents seeking additional compensation.

Initial recruitment included 219 adults with disabilities for this study. Of the original recruitment group, 11 were removed for identifying themselves as not possessing any disability, 33 were removed due to failure to respond correctly to attention check items (e.g. selecting "agree" when prompted by the item to select "strongly disagree"). Table 1 displays descriptive statistics for gender, race, education, and disability classification for all three samples. The final sample size was 169 career-oriented (individuals currently or formerly employed, or those seeking employment) individuals with disabilities, which met minimum sample size criteria based on a 5 variable-to-factor ratio for high communality analysis (Mundfrom, Shaw, & Lu Ke, 2005). The criterion of being "career-orientated" was chosen to increase the response variance, as well as restrict

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the sample to individuals with employment experience, or who desired employment. The participants were administered the P-CRADS, including only items retained after content validity analysis, a demographic questionnaire, and attention check items.

**Instrumentation**

**Demographic Questionnaire.** The Demographic Questionnaire collected demographic information from participants. Items on the survey reflected demographic information recommended for collection by the American Psychological Association (APA, 2010), including age, sex, racial/ethnic group, level of education, and disability classification. Participants were excluded if they didn't report having a disability. Type and age of onset of disability was also collected. Age is scalar; all other items are categorical.

**Pilot-Career Resilience for Adults with Disabilities Scale.** The scale was developed based on resilience theory as outlined by Masten (2001) and Luthans et al. (2006). The P-CRADS used the operational definition of Career Resilience (CR) as "the internal resources and external resources that protect individuals from work stress and hardships that reduce desirable career outcomes". Internal resources include positive affect and self-efficacy in overcoming work stress and hardships, as well as internal strategies used to cope and adapt (Luthans et al., 2006; Masten, 2001). External resources refers to supports external to the individual such as social connections, supportive family members, and work-place supports that encourage and enhance adults with disabilities to continue to pursue desirable career outcomes (Cook & Shinew, 2014; Luthans et al., 2006). Desirable career outcomes include attaining and maintaining employment, earning a living wage (Cimera, 2011), and job satisfaction (Akkerman, Janssen, Kef, &

Meininger., 2014). This definition is consistent with resilience theory (Luthans et al., 2006; Masten, 2001) in a work context (Bimrose & Hearne, 2012; Cardoso & Moreira, 2009; Carson & Bedeian, 1994). Twenty-six items were retained for the P-CRADS after expert review. The format of the P-CRADS items is a 5-point (strongly agree – strongly disagree) format. The items use language consistent with a 5th grade reading level to be appropriate for individuals with a wide range of education and cognitive functioning. All but three items are positively worded. The reading levels were assessed using Flesch-Kincaid grade level ratings (Flesch, 1981).

**Attention Check Items.** Meade and Craig (2012) recommended the addition of bogus "attention check items" for data collection that is either online or involves compensation, as simply adding these items will increase the valid response rate of participants or help identify and delete responders who were inattentive. Several attention check items were included to support that the data being analyzed were valid. These items ask that participants select a specific response (e.g. "Strongly Agree") to check that a participant is paying attention to item content. The participants' accuracy in response to these items did not affect compensation, but did determine inclusion in statistical analysis.

## Results

Missing data were valuated, and were determined to be missing completely at random according to Little's MCAR test, $\chi^2(48) = 37.18$, $p = .87$. It was determined that 0.33% of the data was missing, which was low enough for listwise exclusion for analyses (Tabachnick & Fidell, 2013). No univariate outliers were detected exceeding $|z| > 3$; however, 6 cases were removed due to being multivariate outliers as determined by

Mahalanobis distance ($p < .001$). Thus, the final sample size used for study 1 analysis was $n = 169$. The sample ranged in age from 18 to 70-years-old, with an average age of 31.86 years ($SD = 11.30$ years). Of the 169 participants, 98 (57.99%) were currently employed, with 67 (39.64%) employed in full-time positions and 31(18.34%) employed in part-time positions. Over half ($n = 101$, 59.76%) were born with their disabilities, whereas the remaining participants endorsed acquiring their disabilities. Seventy-four (43.79%) individuals reported receiving workplace accommodations at some point during their careers.

An EFA was conducted to assess the dimensionality of the scale. The analysis utilized a Principal Axis Factoring extraction as underlying latent variables were hypothesized. A direct oblimin rotation was utilized because of the non-orthogonal relationship of the latent variables. The data met required assumptions for an exploratory factor analysis. Bartlett's Test of Sphericity was found to be significant, $\chi^2(78) = 910.01$, $p < .001$. The KMO Measure of Sampling Adequacy was in the "meritorious" range (Kaiser, 1974) at .87. The determinant for the correlation matrix exceeded the .00001 criterion, and was measured to be .003 (Tabachnick & Fidell, 2013).

To determine the number of dimensions extracted, a variety of methods were employed, including a scree plot, the Kaiser criterion, and parallel analysis. These methods were combined with a factor loading cut-off of .32 so that items would account for at least 10% of the shared variance with a factor (Tabachnick & Fidell, 2013). The scree plot suggested one dimension; however upon examining the eigenvalue-greater-than-1.0 Kaiser criterion, a three-factor solution was indicated. An Eigenvalue Monte Carlo Simulation for Parallel Analysis (Horn, 1965) was conducted, which also suggested

a 3 factor model and was the final model. One original factor was retained, Internal Resources (IR), and items from the proposed external resources subscale were split into two factors: External Processing (EP) and External Support (ES). External Processing contains items that query a respondent's willingness to talk to others about work-related problems. Whereas External Support contains items that query a person's active seeking and use of support or help in dealing with work problems. Twelve items were removed from further analysis due to low factor loadings (< .32) on all factors or loading on more than one factor. After removal of the 12 items, results indicated that the three-factors accounted for 53.60% of the variance. Table 2 shows the mean, standard deviation, and factor loadings of the retained items for the sample. Cronbach's alpha for the suggested subscales ranged from .80 to .83, with the alpha for the total scale being .88.

**Discussion**

Though it was predicted that the CRADS would represent two factors, three factors were suggested by the EFA following an Eigenvalue Monte Carlo Simulation for Parallel Analysis (Horn, 1965). The predicted external resilience subscale was separated into two subscales based on factor loadings, external processing with item content focused on talking about work stressors with others and external support with item content focused on seeking support/help for stressors from others. Items that possessed factor loadings below .32 on any factor were removed; establishing the final structure of the CRADS as being 13 items long and possessing three subscales: Internal Resources (five items), External Processing (four items), and External Support (four items).

**Study 2a**

The purpose of Study 2 was to assess the CRADS reliability and validity. Study 2a tested the CRADS using multiple methods of reliability and validity analyses including internal consistency (Cronbach's alpha) and construct validity through convergent and concurrent validity analyses. Study 2b evaluated the CRADS for test-retest reliability after a 1-month interval. Studies 2a and 2b were designed to answer the following research questions:

- RQ2: Do CRADS scores exhibit reliability?

    o RQ2a: Do CRADS scores exhibit adequate internal consistency?

    o RQ2b: Do CRADS scores exhibit adequate reliability over a one-month period?

- RQ3: Do CRADS scores demonstrate adequate construct validity?

    - RQ3a: Do CRADS scores exhibit adequate convergent validity?

    - RQ3b: Do CRADS scores exhibit adequate concurrent validity?

**Method**

**Participants and Procedure**

Recruitment occurred through the same sources and methods as Study 1. Participants were compensated exactly as in Study 1. The participants in this study were 155 adults. Of the original recruitment group, 10 were removed for identifying themselves as not possessing any disability, 16 were removed due to failure to respond correctly to any attention check item. The final sample included 129 individuals with disabilities. Participants were given the CRADS, CD-RISC, CCM, BRS, CTI, and demographics questionnaire, administered online through Qualtrics. Scores on the BRS

and CD-RISC were expected to correlate positively with scores on the CRADS, while scores on the CTI were expected to correlate negatively with cores on the CRADS. The CTI manual notes that individuals with higher scores on the CTI may be "more likely to perceive themselves as unable to cope effectively with stress, and more likely to become dependent, hopeless, or panicked when facing emergency situations" (Sampson et al., 1996; p. 28). Therefore, it is predicted that there would be a negative correlation between the CTI and the CRADS. Participants were also asked if they would be willing to be contacted in one month to complete the CRADS again. Individuals who indicated they would be willing to be contacted again were asked to include their email address so they could be contacted.

**Instrumentation**

In addition to finalized version of the CRADS, attention check items, and the demographics questionnaire used in Study 1, participants were also given the CD-RISC, CCM, BRS, and the Career Thoughts Inventory (CTI; Sampson, Peterson, Lenz, Reardon, & Saunders, 1996) described below.

**Career Resilience for Adults with Disabilities Scale.** The finalized version of the CRADS includes 13 items based on resilience theory as outlined by Masten (2001) and Luthans et al. (2006).

**Brief Resilience Scale.** The BRS (Smith et al., 2008) is a general resilience scale assessing one's self-assessment of his/her ability to "bounce back." The BRS is modeled after Masten (2001) resilience theory. The purpose of using the BRS was to establish convergent validity with the CRADS, as both are based on the same underlying theory. The BRS is a 6-item scale utilizing a 5-point Likert type scale (1 = strongly disagree to 5

= strongly agree). The test utilizes three positively coded and three negatively worded (reverse-scored) items. A sample positively coded item is "I tend to bounce back quickly after hard times," and a sample negatively coded item is "I have a hard time making it through stressful events." After responses are recoded, higher scores reflect higher levels of resilience.  The Cronbach's alpha for the samples ranged from .80 to .91, and test-retest reliability at 3 months with samples 2 and 3 was .69 and .62, respectively. The Cronbach's alpha for the BRS in the current study was .82.

**Connor-Davidson Resilience Scale.** The Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003) is a general resilience scale assessing personal characteristics that align with resilience theory. It was developed to test for resilience to anxiety, depression, and stress reactions in the development of PTSD symptoms. The CD-RISC contains 25 items asking participants to rate how true states are perceived. Responses include 5-point (0 = not true at all to 4 = true nearly all of the time) item structure. Sample items include "I am able to adapt to change" and "I tend to bounce back after illness or hardship." Higher scores reflect greater resistance to the development of stress symptoms. The scale was normed using 6 groups: group 1 was 577 non help-seeking individuals, group 2 was 139 primary care outpatients, group 3 was 43 psychiatric outpatients in private practice, group 4 consisted of 25 participants in a separate Generalized Anxiety Disorder (GAD), and groups 5 and 6 consisted of two groups participants in clinical trials for PTSD.  The scale showed strong convergent validity, correlating with the Kobasa hardiness measure ($r = 0.83$), and was significantly negatively correlated with the Perceived Stress Scale (PSS-10*;* Cohen, Kamarck, & Mermelstein, 1983) at $r = -.76$. The scale was also able to successfully discriminate

between the clinical samples (normin groups 2-6) and the non help-seeking sample (

norming group 1). Test-retest reliability was assessed with groups four and five and

evinced a high intraclass correlation coefficient ($r = 0.87$) after an unspecified time.

**Career Commitment Measure.** The Career Resilience subscale from Carson and

Bediean's (1994) Career Commitment Measure (CCM) was used to establish additional

convergent validity. The 4-item career resilience subscale includes items such as "Given

the problems I encounter in this line of work/career field, I sometimes wonder if the

personal burden is worth it." The items are scored on a 5-point (1 = strongly disagree, 5 =

strongly agree) Likert-type scale. Lower scores on the subscale indicate greater resistance

to career hardships. The CCM has demonstrated positive relationships with career

satisfaction and acceptable internal consistency reliability, with a Cronbach alpha of .87

among MBA students, undergraduates, and career professionals. However, internal

consistency or stability reliability was not explicitly provided for the Career Resilience

Scale. The Cronbach's alpha for the CCM's Career Resilience scale in the current study

was .72. The Career Resilience Subscale was weakly but negatively correlated ($r = -.31$)

with job withdrawal cognitions measured by the Blau's Career Commitment scale (Blau,

1985).

**Career Thoughts Inventory.** The CTI is a 48-item, self-administered instrument

related to career problem solving. The CTI is based on the Cognitive Information

Processing (CIP) model (Peterson, Sampson, & Reardon, 1991). The CTI possesses three

subscales, Decision Making Confusion (DMC), Commitment Anxiety (CA), and External

Conflict (EC). Items range on a 4-point Likert-type scale from 0 (strongly disagree) to 3

(strongly agree). All items are expressed negatively, with no reverse coding. The CTI was

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normed on 1,562 adults, college students, and high school students (Sampson et al., 1996). For each group, alpha coefficients were determined and found to be in the following ranges: Total score alpha = .93 - .97; DMC, .90 - .94; CA, .74 - .81; and EC, .74 - .81. Test-retest reliability scores for the subscales were also generated at a 4-week interval and were .77 for DMC, .75 for CA, and .63 for EC. The Cronbach's alphas for the CTI scales in the current study were: Total score alpha = .96; DMC = .95; CA = .80; and EC = .76.

## Results

Missing data were then evaluated, and were determined to be missing completely at random according to Little's MCAR test, $\chi^2(464) = 457.29$, $p = .58$. It was determined that 1.09% of the data were missing, which was low enough for listwise exclusion for analyses (Tabachnick & Fidell, 2013). No univariate outliers were detected exceeding $|z| > 3$; as well as no multivariate outliers as determined by a Mahalanobis distance equal to or exceeding $p < .001$. Thus, the final sample size used for study 1 analysis was $n = 129$.

The sample ranged in age from 18 to 60-years-old, with an average age of 30.19 years ($SD = 10.56$ years). Of the 129 participants, 62 (48.06%) were currently employed, with 36 employed in full-time positions and 26 employed in part-time positions. Of the unemployed respondents, 30 (23.26%) reported currently looking for work, whereas 37 (28.68%) were not looking for work at the time they took the survey. Again, over half ($n = 82$, 63.56%) were born with their disabilities, and the remainder endorsed acquiring their disabilities.

**Internal Consitency**

      Composite subscale scoresand a composite full-scale score were generated from the averages of the properly coded items of the CRADS. Internal consistency reliabilities were computed for the individual subscales and the full scale. Though lower than the first sample, the Cronbach's alphas was still in the acceptable range for all subscales and the composite scale, ranging from .71 to .79 for the subscales and .84 for the CRADS total scale. The complete results of the analyses are presented in Table 3.

**Convergent Validity**

      In order to provide support for the CRADS validity, convergent analyses were conducted with the CRADS and additional measures. In order to demonstrate that the CRADS scores align with other measures of the core construct, participants were also given the BRS, CD-RISC, and the CTI. Table 3 reports the correlations among Study 2 sample. As indicated, the CRADS Total score had significantly positive correlations with all three comparison measures, though the strength of the correlations vary. The CRADS correlates weakly positively with the CCM ($r = .29$, $p = .003$), weakly positively with the BRS ($r = .44$, $p < .001$), and moderately positive with the CD-RISC ($r = .63$, $p < .001$). Though the two external subscales of the CRADS (External Processing and External Support) had a small to medium negative correlation with all CTI scales, ranging from $r = -.11$ to $-.34$, both the Internal Resources subscale ($r = -.63$, $p < .001$) and the CRADS total score ($r = -.57$, $p < .001$) had a large negative correlation with CTI scales.

**Concurrent Validity**

      For concurrent validity, scores on the CRADS were compared between two groups of respondents to ascertain whether the CRADS was able to successfully

distinguish between adults with disabilities who were employed with adults with disabilities who were unemployed (previously employed) and not actively seeking employment at the time they took the survey. An independent samples *t*-test was conducted comparing the two groups on CRADS total scores. The Levene's Test for Equality of Variance was found to be non-significant ($p > .05$); thus the assumption of equality of variance was met. Participants who were employed ($n = 62$, $M = 3.71$, $SD = 0.56$) scored significantly higher than those who were not employed and were not actively seeking employment ($n = 34$, $M = 3.27$, $SD = 0.59$), $t(94) = 3.97$, $p < .01$, $d = 0.77$.

## Discussion

The results from both samples suggest that the individual subscales and the full scale Cronbach's alphas meet the minimum criteria of .70, as described by Nunnally and Bernstein (1994). The Cronbach's alpha for the subscales ranged from .71 to .83, and the full-scale alpha for each sample was .89 and .84, respectively. Based on these internal consistency scores the CRADS appears adequate for future use.

Research Question 3 focused on the construct validity of the CRADS through comparisons with other scales measuring similar constructs. Evidence of construct validity was mixed. The CRADS demonstrated statistically significant and sufficiently strong convergent validity with the CD-RISC due to the strong correlation ($r = .63$; Cohen, 1992) between the CD-RISC and the CRADS total score. The correlation between the CRADS and the BRS ($r = .44$), was moderately strong, but was lower than the desired $r = .60$ criterion. However, this may be because the BRS items' content all focused on what would be considered internal resilience, rather than both internal and

external resilience. This is supported by the fact that the Internal Resilience subscale correlated more strongly with the BRS ($r = .50$) than the External Processing ($r = .23$, $z = 2.5$, $p < .01$) and the External Support ($r = .31$, $z = 1.8$ $p < .05$) subscales using Fisher r to z transformations (Fisher, 1915). Similarly, the Career Resilience subscale of the CCM correlated weakly with the CRADS total score ($r = .29$; Cohen, 1992), though it was also significant.

Additional convergent validity was assessed by correlating the CRADS with the CTI. It was predicted that the CTI and its subscales and would strongly negatively correlate with CRADS scores due to the CTI's prediction of poor coping in the workplace (Sampson et al., 1996)., Parts of the CTI did correlate significantly (negatively) with the CRADS. Both External Processing ($r = -.14$, $r = -.13$, and $r = -.11$ respectively) and External Support ($r = -.34$, $r = -.18$, and $r = -.21$ respectively) correlated weakly with all CTI subscales and the total score; however, using a Fisher r to z transformation (Fisher, 1915), it was determined Internal Resources correlated more strongly with the CTI total score ($z = 3.95$, $p < .001$), as did the the CRADS total score ($z = 2.51$, $p < .01$).

One explanation for the descrepincies between scales measuring similar constructs and the CRADS is the mixed focus of scales' items on internal and external resources. The CCM and BRS items focus exclusively on internal qualities, like perseverance, which is one possibile explanation for why the CRADS Internal Resources subscale had a medium correlation ($r = .37$) with the CCM and large correlation with the BRS ($r = .50$; Cohen, 1992). However, similarly to the CRADS, some of the CD-RISC items also incorporated external resources that a person might utilize to bounce back from hardship, which could explain why External Processing and External Support had

stronger correlations with the CD-RISC ($r = .37$ and $r = .49$ respectively) than either the

CCM ($r = .06$ and $r = .23$ respectively) or the BRS ($r = .23$ and $r = .32$ respectively).

In order to address concurrent validity, CRADS scores were compared between

two groups that would be expected to have different levels of career resilience:

individuals with disabilities who were employed and individuals with disabilities who

were previously employed but were no longer actively seeking employment. The results

were statistically significant in that adults with disabilities, who were employed,

exhibited higher levels of career resilience than those who were no longer employed and

not seeking employment, with a medium to strong effect size of $d = .77$ (Cohen, 1992).

This result suggests the answer to the research question is "yes," though additional

analyses in the future are warranted to compare more groups as well as evaluating the

CRADS for predictive validity.

## Study 2b

Study 2b was conducted in order to evaluate the CRADS for test-retest reliability

after a 1-month interval.

## Method

### Participants and Procedures

Twenty one participants from Study 2a, who indicated they would be willing to be

contacted again were asked to include their email address so they could be contacted,

participated in Study 2b. Participants were informed that they would not be compensated

for this part of the study when they volunteered in Study 2a. They were contacted after

1-month from when they participated in Study 2a and provided with the finalized

CRADS. Scores from their original and followup survey were compared in the analysis.

Of the recruited group, one was removed due to failure to respond correctly to attention check items. The sample ranged in age from 18 to 50-years-old, with an average age of 32.11 years ($SD = 9.45$ years). Of the 20 participants, 10 (50%) were currently employed, with 5 employed in full-time positions and 5 employed in part-time positions, whereas the remaining 10 were all seeking employment. Seven (35%) were born with their disabilities, whereas the remaining participants endorsed acquiring their disabilities. Remaining demographic information is described as "Sample 3" in Table 1.

## Results

No missing data were present. No univariate outliers were detected exceeding $|z| >$ 3, and no multivariate outliers were detected as determined by a Mahalanobis distance threshold of $p < .001$. The sample's scores at Time 2 were compared to their scores at Time 1 to establish test-retest reliability, which was $r = .91$ for the full-scale CRADS score, $r = .88$ for Internal Resources, $r = .66$ for External Processing subscale, and $r = .82$ for External Support subscale.

## Discussion

Though the sample size was small ($n = 20$) for volunteers participating in this study, the full scale and two subscales exceeded the minimum desired criterion of $r > .70$ (Nunnally & Bernstein, 1994). The External Processing subscale was slightly below the desired criterion; however approached .70. This could be due to low number of items in the subscale. Future studies should verify the reliability of the External Processing factor with a larger sample over time.

## General Discussion

The purpose of these studies was to develop and test a new career resilience scale for adults with disabilities that assesses their ability to attain desirable career outcomes, despite systemic hardships. In order to answer the posed research questions, the CRADS was examined in two studies. The CRADS is a brief, self-report measure of career resilience with sound psychometric properties for early research in the domain of career resilience for adults with disabilities. The findings in this study suggest that the CRADS has utility in research settings. It can be used to screen individuals with disabilities involved in vocational training, rehabilitation, and counseling to assess their response to work-related stressors and barriers that have been shown to have substantially negative effects of the population's ability to attain and maintain employment. The CRADS also enables more research into interventions for this population to promote better career outcomes.

CRADS has several advantages over similar scales. It is written at a low reading level to maximize utility for various levels of cognitive functioning. Unlike other career resilience scales, it has been normed specifically on a population of adults with disabilities with broad representation of disability types. With only 14 items, it is a brief instrument ideal for use in work and disability focused research. It has strong preliminary psychometric properties including acceptable internal reliability, convergent validity, and concurrent validity.

### Implications

The results suggest that the CRADS has a unique place and utility in disability and career research. Enrollees in work incentive or vocational training/placement

programs still encounter many vocational barriers (Hernandez et al., 2007). No career

resilience scale had been designed for, or normed on, a population of adults with

disabilities before the CRADS. With the CRADS, counselors involved in workforce

training and service provision to individuals with disabilities can now screen for a client's

resistance to workplace stressors. The CRADS allows for the development of

interventions to promote an individual's resilience to career stressors to be researched as

they apply to a disabled population. If an individual lacks internal resources, he/she may

benefit from traditional therapy to promote self-confidence and positive self-talk. For

example, Luthans and colleagues (2006) found that stress inoculation can help promote

an individual's resistance to career stress. Conversely, individuals who lack external

resources may benefit from counseling on interpersonal skills, career search skills, and

networking. For instance, Kregel and O'Mara (2011) identified work incentives

counseling to be a positive intervention for improving employment outcomes, as it

provides individuals with external support to help navigate employment and Social

Security benefits. Additionally, Seibert, Kramer, and Heslin (2016) offered suggestions

for multiple behavioral, systemic, and psychotherapeutic interventions that promote an

individual's career resilience and adaptability. These interventions broadly include

emotional regulation skill building (urge surfing, cognitive restructuring, etc.) and

professional relationship building training (networking skill building, interpersonal

training, etc.). However, these interventions have not yet been researched as to their

effectiveness with individuals with disabilities. The process of empirically validating

these kinds of interventions can be supported by using the CRADS to assess progress and

outcomes.

There are several directions for research to go next. First, the current CRADS factor structure should be verified through a confirmatory factor analysis. Following that, the CRADS should be tested for predictive validity, to determine if scores on the CRADS can predict a person's response to work place stress over time. Theoretically, the CRADS should be able to predict positive vocational outcomes including employment status, length of employment, and employment satisfaction. Additionally, discriminant validity analyses should be conducted, comparing the CRADS scores against scale scores representing dissimilar constructs.

Differences between disability classifications and disability severity should also be explored as their levels of career resilience may differ. Different disability classifications and degree of severity  have been shown to have varying severity of dysfunctional career thoughts (Yanchak, Lease, & Strauser, 2005), different experiences with career barriers (Sevak & Kahn, 2016), as well as beliefs about what disability classifications are more valued in the workplace (Hernandez, Keys, & Balcazaar, 2000). Additionally, though the CRADS has been shown to be useful as a research instrument, it may also have utility as a clinical instrument; however, further evidence needs to be gathered and analyzed before such a claim can be made. Last, though the CRADS showed evidence of concurrent validity comparing employed individuals with disabilities against others who were no longer employed and were not seeking employment, the directionality of this difference is not established. In other words, it may be because the individuals are employed that they have higher scores on the CRADS, or do they have greater career resilience and therefore they are able to maintain employment.

Longitudinal studies examining how career resilience changes or doesn't change over time will be useful in establishing support for directionality.

**Limitations**

Several limitations to this study are noted. First the use of only self-report measures risks increasing measurement error due to common method variance, or variance resulting from the method of data collection rather than the thing trying to be measured (Podsakoff, Mackenzie, Lee, & Podsakoff, 2003). This effect may be reduced due to mixed context of data collection (i.e. some with hard copy surveys and others with online surveys), which can reduce method variance (Mitchell, 1985); however, intercorrelations between measures may be artificially inflated due to the common self-report method of data collection. Self-report measures also carry the risk of impression management interfering with the results, as participants wish to portray themselves in a positive light (Paulhus, 1991). Respondents may respond more positively, skewing responses and limiting their variance. However, due to the participants responding anonymously to the surveys, this effect may have been minimized (Booth-Kewley, Edwards, & Rosenfeld, 1992). Evidence against significant effect of common method variance and impression management is the EFA's support for a 3-factor model rather than a 1-factor model. Nevertheless, future research with the CRADS should incorporate multiple measurement methods to reduce the inflation of measurement error as well as a method of controlling for the influence of impression management and common method variance.

The addition of study participation incentives is another notable limitation in human subjects research as it may impact study replicability (Klitzman, Albala, Siragusa,

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Nelson, & Applebaum, 2007). In this study, incentive in the form of financial

compensation was provided to participants; however methods were used to both exclude

individuals who fail to meet inclusion criteria (through targeted recruitment) and prevent

users from repeatedly taking the survey for compensation (by only allowing

compensation to be received at a mailing address, with no repeated addresses). Despite

this, it is still possible that some participants in the study failed to meet inclusion criteria.

Study 2b evaluated the CRADS for test-retest reliability. Although the reliability

statistic for the full CRADS and most of the subscales was above the desired $r > .70$

criterion, the sample size of this study was only $n = 20$. This reduces the replicability of

these results, and the test-retest analysis should be conducted with a larger sample to

ensure accuracy of the results. Additionally, self-selection bias is a concern for any study

utilizing a non-randomly selected sample (Heckman, 1979). The offer of compensation

for participation in the previous studies may distort the results, as participants in this

study were volunteers without additional compensation.

Another limitation of this study is the underrepresentation of certain demographic

groups. The samples were overwhelmingly Caucasian, and future research would benefit

from ensuring a more diverse representation. Research has shown the gender (Boeltzig,

Timmons, and Butterworth, 2009) and race (Balcazar et al., 2013) can have a

compounding effect on reducing individuals with disabilities attaining and maintaining

competitive employment. Therefore, individuals with different demographic backgrounds

may experience resilience differently. Additionally, some disability classifications were

underrepresented in the sample. For instance, people with sensory disabilities make up

between 14-27% of the population with disabilities according to the most recent U.S.

Census (2012); however, in this study they only made up about 9% of the studies'

samples. Full representation of disability type is necessary to ensure the CRADS utility

with all individuals with disabilities, especially given that individuals with sensory

disabilities have been shown to feel less valued at work than individuals with other

disability classifications (Hernandez et al., 2007).

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Table 1

*Demographic Information*

| Dimension | Sample 1 | Sample 2 | Sample 3 |
|---|---|---|---|
| | N (%) | N (%) | N (%) |
| Total | 169 (-) | 129 (-) | 20 (-) |
| Gender | | | |
|   Male | 81 (47.9%) | 65 (50.4%) | 7 (35.0%) |
|   Female | 86 (50.9%) | 60 (64.5%) | 13 (65.0%) |
|   Trans or Other | 2 (1.2%) | 4 (3.2%) | 0 (0.0%) |
| Racial/Ethnic Background | | | |
|   African American/Black | 20 (11.8%) | 23 (17.8%) | 1 (5.0%) |
|   Asian/Pacific Islander | 4 (2.4%) | 4 (3.1%) | 0 (0.0%) |
|   Hispanic or Latino | 11 (6.5%) | 7 (5.4%) | 1 (5.0%) |
|   Native American | 3 (1.8%) | 2 (1.6%) | 0 (0.0%) |
|   White or Caucasian | 130 (76.9%) | 90 (69.8%) | 18 (90.0%) |
|   Other | 1 (0.6%) | 3 ( 2.3%) | 0 (0.0%) |
| Education | | | |
|   No high school | 0 (0.0%) | 1 (0.8%) | 0 (0.0%) |
|   Some high school, no degree | 9 (5.3%) | 6 (4.7%) | 1 (5.0%) |
|   High school graduate or GED | 43 (25.4%) | 36 (27.9%) | 2 (10.0%) |
|   Some college, no degree | 36 (21.3%) | 26 (20.2%) | 6 (30.0%) |
|   Trade/technical training | 9 (5.3%) | 8 (6.5%) | 1 (5.0%) |
|   Associate's degree | 7 (4.1%) | 5 (3.9%) | 0 (0.0%) |
|   Bachelor's degree | 38 (22.5%) | 26 (20.2%) | 4 (20.0%) |

Table 1 (Continued)

*Demographic Information*

| Dimension | Sample 1 N (%) | Sample 2 N (%) | Sample 3 N (%) |
|---|---|---|---|
| Master's degree | 22 (13.0%) | 16 (12.2%) | 5 (25.0%) |
| Professional degree | 3 (1.8%) | 2 (1.6%) | 0 (0.0%) |
| Doctorate degree | 2 (1.2%) | 3 (2.3%) | 1 (5.0%) |
| Disabilities Possessed* | | | |
| Physical | 88 (52.1%) | 66 (51.2%) | 17 (85.0%) |
| Sensory | 19 (11.2%) | 7 (5.4%) | 0 (0%) |
| Learning | 47 (27.8%) | 24 (26.4%) | 3 (15.0%) |
| Developmental | 35 (20.7%) | 56 (44.4%) | 3 (15.0%) |
| Psychiatric | 47 (27.8%) | 33 (25.6%) | 7 (35.0%) |
| Multiple Disabilities | 49 (29.0%) | 54 (41.4%) | 9 (45.0%) |

*Disabilities not measured as mutually exclusive

Table 2

*Mean, Standard Deviation, and Factor Loadings of CRADS Items*

| Item | Mean | SD | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|---|---|
| 1. I keep working even if my job gets hard. | 3.98 | 0.90' | **.853** | .072 | -.160 |
| 2. Even with tough tasks, I always make sure that I am doing my job well. | 4.15 | 0.72 | **.680** | -.155 | .099 |
| 3. I would try to fix a problem at work before I think about quitting. | 4.05 | 0.93 | **.640** | .051 | .029 |
| 4. I would not give up if I couldn't find a job for a while. | 3.64 | 1.15 | **.542** | .071 | .070 |
| 5. I am able to handle problems at work. | 3.63 | 1.00 | **.519** | .075 | .078 |
| 6. I frequently talk to others about work. | 3.35 | 1.11 | -.116 | **.948** | -.051 |
| 7. I find it helpful to talk about work. | 3.59 | 1.01 | .165 | **.657** | .018 |
| 8. I talk to others if work is stressful. | 3.54 | 1.14 | .158 | **.529** | .168 |
| 9. When work is frustrating, I talk about it with others. | 3.60 | 1.03 | .080 | **.522** | .184 |
| 10. Others support me at work. | 3.66 | 0.96 | -.087 | -.039 | **.967** |
| 11. Others are supportive of my job. | 3.86 | 0.86 | .198 | -.041 | **.673** |
| 12. I can go to my coworkers for help. | 3.48 | 1.03 | -.012 | .238 | **.605** |
| 13. I know who to ask for help if I need it at work. | 3.68 | 1.07 | .123 | .127 | **.411** |

*Note.* Factor loadings > .32 are boldface. Factor 1: Internal Resources. Factor 2: External Processing. Factor 3: External Support.

Table 3

*Means, Standard Deviations, Internal Consistencies, and Intercorrelations of Study Scales*

| Scale | M | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | *r* | | | | | | |
| 1. CRADS Internal Resources | 3.88 | 0.73 | (.75) | | | | | | | | | | |
| 2. CRADS External Processing | 3.40 | 0.86 | .28** | (.79) | | | | | | | | | |
| 3. CRADS External Support | 3.51 | 0.77 | .50** | .57** | (.71) | | | | | | | | |
| 4. CRADS Total Score | 3.63 | 0.62 | .76** | .77** | .85** | (.84) | | | | | | | |
| 5. Brief Resilience Scale | 2.84 | 0.84 | .50** | .23** | .32** | .44** | (-) | | | | | | |
| 6. CD-RISC | 57.63 | 17.22 | .61** | .37** | .49** | .63** | .59** | (-) | | | | | |
| 7. CCM Career Resilience | 8.15 | 2.86 | .37** | .06 | .23* | .29** | .47** | .29** | (-) | | | | |
| 8. CTI Decision Making Confusion | 14.57 | 10.01 | -.65** | -.14 | -.34** | -.49** | -.49** | -.60** | -.48** | (-) | | | |
| 9. CTI Commitment Anxiety | 13.84 | 5.57 | -.44** | -.13 | -.18 | -.33** | -.38** | -.39** | -.41** | .71** | (-) | | |
| 10. CTI External Conflict | 5.94 | 3.35 | -.40** | -.11 | -.21* | -.42** | -.42** | -.39** | -.45** | .55** | .63** | (-) | |
| 11. CTI Total Score | 57.71 | 26.07 | -.63** | -.14 | -.32** | -.57** | -.57** | -.59** | -.53** | .93** | .84** | .74** | (-) |

*Note.* Included scale abbreviations are Career Resiliance for Adults with Disabilities Scale (CRADS), Connor-Davidson Resilience Scale (CD-RISC), Career Commitment Measure (CCM), and Career Thoughts Inventory (CTI), Cronbach's alpha estimates for CRADS and subscales are in parenthesis.

*p<.05

**p<.01

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