

Psychometric Report for the Survey used in the College Internship Study and the National Survey of College Internships

Zi Chen, Jiahong Zhang, Zhidong Chen
Center for Research on College-Workforce Transitions (CCWT)
University of Wisconsin-Madison

Purpose and Procedures of the Psychometric Report

The purpose of this psychometric report is to describe the reliability and structure of each scale used in the survey instrument used for the College Internship Study (a mixed-methods, longitudinal study of CCWT) and the National Survey of College Internships (NSCI). While there are small differences between the two instruments (e.g., the NSCI does not include the career adaptability scale), many of the scales and sections are the same. The reliability of the various scales used in the survey are described by providing their Cronbach’s alpha scores; and the structure of each scale is described through Confirmatory Factor Analysis (CFA). In the following sections, a description of internal consistency reliability and confirmatory factor analysis results are provided. Thereafter, the findings from each scale are presented, along with the details of each scale.

Internal Consistency Reliability

The internal consistency reliability of the scales is evaluated using *Cronbach’s alpha* (Cronbach, 1951), which is a number between 0 and 1 that describes the extent to which all the items in a scale measure the same concept or construct (Tavakol & Dennick, 2011). A higher value indicates more reliability. As a rule of thumb, a Cronbach’s alpha of .90 or higher indicates excellent reliability; an alpha between .80 and .89 indicates good reliability; between .70 and .79 is acceptable; between .60 and .69 suggests reliability is questionable; between .50 and .59 suggests poor reliability; and .50 or less is considered unacceptable (George & Mallery, 2003, p. 231).

Confirmatory Factor Analysis

Originally developed by Jöreskog (1969), *Confirmatory Factor Analysis (CFA)* is a type of factor analysis that is used to confirm the structure of a scale, based on either a priori theoretical assumptions, or results of an Exploratory Factor analysis. In this report, in order to assess whether the pre-determined factor structure adequately represents the data, the Chi-square statistic—along with its degrees of freedom and *p* value—was examined, as well as other fit indicators that are less affected by sample size and model misspecification (Hooper, Coughlan, & Mullen, 2008; Hu & Bentler, 1999; Martens, 2005). These indicators included several model fit indices, such as the *Comparative Fit Index (CFI)*, the *Tucker–Lewis index (TLI)*, the *Root Mean Square Error of Approximation (RMSEA)*, and the *Standardized Root Mean Square Residual (SRMR)*. The cutoff criteria for the fit indices used in this report are presented in the following table:

Table 1. Acceptability Cutoff Criteria for Model Fit Indices

Index	Cutoffs	Reference
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CFI & TLI	Acceptable values are 0.90 or more (> 0.90 acceptable, >0.95 excellent)	Bentler, 1990; Tucker & Lewis, 1973
RMSEA	Acceptable values are 0.08 or less (< 0.08 acceptable, <0.05 excellent)	Browne & Cudeck, 1993
SRMR	Acceptable values are 0.08 or less (< 0.08 acceptable, <0.05 excellent)	Hu & Bentler, 1999

Method

Data Collection Process

Between the spring of 2018 and the spring of 2020, the Center for Research on College-Workforce Transitions conducted a mixed-method longitudinal study on college students' internship participation at 13 higher education institutions in the United States. We mailed an invitation letter to 16,191 students who were in the second half of their degree programs (i.e., junior and seniors at 4-year institutions; second-year students at 2-year programs), inviting them to participate in the online survey of the study. A five-dollar cash incentive was enclosed in each envelope to increase the prospects of participation in our survey. The survey included questions pertaining to students' participation and experiences in well-defined internships. Training experiences such as clinical practicums (e.g., teacher education or nursing practicums) or apprenticeship programs were not considered internships. A total of 3,809 students completed the survey for a total response rate of 23.5%. However, only 3,579 participants provided complete responses that could be used in our analyses.

Participants

The working sample for our analyses includes a total of 3,579 students who were in the second half of their degree programs at the time of data collection—i.e., junior and seniors at 4-year institutions; second-year students at 2-year programs. Of the students completing the survey, 2,499 (69.8%) had no internship experience, while 1,080 (30.2%) had participated in an internship in the 12 months prior to the time of data collection; 2,363 (66%) identified as female and 1,174 (33.8%) as male; 1,270 (35.5%) participants identified as White, 1,370 (38.3%) as Black, 192 (5.4%) as Asian, 527 (14.7%) as Hispanic, 25 (0.70%) as American Indian or Alaska Native, 28 (0.78%) as International, 4 (0.11%) as Native Hawaiian or Pacific Islander, 115 (3.2%) as two or more races/ethnicities, and information on race and ethnicity was not available for 46 students (1.3%). Regarding types of institutions, 916 (25.6%) were students from 4-year public colleges, 1,360 (38.0%) were from historically Black colleges or universities (HBCUs), 763 (21.3%) were from technical colleges, and 540 (15.1%) were from Hispanic serving institutions (HSIs). There were 1,530 respondents (42.7%) who reported themselves as first-generation college students, while 2,044 (57.1%) reported being continuing-generation college students. The age of these participants ranged from 12 to 79 years old (mean = 26.7; SD = 8.5 years old). Of the students who participated in internships, 463 (42.9%) had unpaid internships while 617 (57.1%) reported having paid internships.

Data analysis

Cronbach's alpha scores were examined, and Confirmatory Factor Analysis (CFA) was conducted using R software (2018) to assess the internal consistency reliability and the structure of the scales. The full sample of 3,579 participants was used to conduct analyses of the Career Adapt-Ability Scale. However, for the Goal Clarity, Supervisor Support, Autonomy and Supervisor Mentoring scales, this study only utilize data for those who participated in an internship (n = 1,080). Additionally, a sample of 618 participants was used for the analyses of the Developmental Scale.

The following scales were included in both analyses of Cronbach's alpha and CFA:

- Career Adapt-Ability Scale
- Supervisor Support Scale
- Supervisor Mentoring Scale
- Developmental Value Scale

For the following two scales, only coefficients of Cronbach's alpha are provided because they are two-item scales that are not suitable for CFA, which is a method requiring a scale structure with at least three items.

- Autonomy Scale
- Goal Clarity Scale

Reliability Coefficient and Confirmatory Factor Analysis and Instrument Detail

Career Adapt-Ability Scale (CAAS)

The 24-item Career Adapt-Abilities Scale (CAAS) (Savickas & Porfeli, 2012) was used to measure individuals' career adaptability in four dimensions — concern, control, curiosity, and confidence— with 6 items in each dimension. *Career adaptability* refers to a psychosocial construct that denotes one's "resources for coping with current and anticipated tasks, transitions, traumas in their occupational roles that, to some degree large or small, alter their social integration." (Savickas, 1997). The *Career Concern* subscale measures the extent to which individuals are future-oriented and aware of the importance of planning for the future. The *Career Control* subscale measures the extent to which individuals take responsibility and control over their vocational behaviors and decision-making. The *Career Curiosity* subscale measures the extent to which individuals explore possible selves and future opportunities. And the *Career Confidence* subscale measures the extent to which participants believe that they can turn their goals into reality. All items are scored using a 5-point Likert-type scale (1 = Not strong, 2 = Somewhat strong, 3 = Strong, 4 = Very Strong, 5 = Strongest), with higher scores indicating greater career adaptability.

A confirmatory factor analysis was employed to assess the 4-factor structure of the CAAS. The results showed that $\chi^2(246) = 3958.3, p < .001, CFI = .915, TLI = .905, RMSEA = .065$, with 90% CI = 0.063 – 0.067 and SRMS = .037, indicating that the factor structure provided a fair estimation. Cronbach's alphas for the subscales and composite total were all adequate with coefficients of .84 for concern, .84 for control, .86 for curiosity, .89 for confidence and .94 for the total scale.

CAAS Item Set

Career Concern

1. *Thinking about what my future will be like.*
2. *Realizing that today's choices shape my future.*
3. *Preparing for the future.*
4. *Becoming aware of the educational and vocational choices that I must make.*
5. *Planning how to achieve my goals.*
6. *Concerned about my career.*

Career Control

7. *Keeping upbeat.*
8. *Making decisions by myself.*
9. *Taking responsibility for my actions.*
10. *Sticking up for my beliefs.*
11. *Counting on myself.*
12. *Doing what's right for me.*

Career Curiosity

13. *Exploring my surroundings.*
14. *Looking for opportunities to grow as a person.*
15. *Investigating options before making a choice.*
16. *Observing different ways of doing things.*
17. *Probing deeply into questions I have.*
18. *Becoming curious about new opportunities.*

Career Confidence

19. *Performing tasks efficiently.*
 20. *Taking care to do things well.*
 21. *Learning new skills.*
 22. *Working up to my ability.*
 23. *Overcoming obstacles.*
 24. *Solving problems.*
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Supervisor Support Scale (SSS)

Supervisor support (McHugh, 2017; Shanock & Eisenberger, 2006) is measured with a four-item scale used to assess the extent to which internship supervisors care about interns' well-being and satisfaction at work. All items are scored with a 5-point Likert-type scale rating from 1 to 5 (1 = Not at all, 2 = A little, 3 = Some, 4 = Quite a bit, 5 = A great deal). Higher scores indicate individuals' greater perceived support from their supervisors.

A confirmatory factor analysis was employed to assess the one-factor structure of SSS. Results showed that $\chi^2(2) = 24.0$, $p < .001$, CFI = .992, TLI = .975, RMSEA = .101 with 90% CI = 0.067 – 0.139, SRMS = .014. It should be noted that the RMSEA indicator is slightly higher than .08. However, according to the results of other model fit indices (i.e., CFI, TLI and SRMR), we

consider the factor structure an acceptable estimation. Cronbach's alpha for the scale was .90, indicating excellent internal reliability.

SSS Item Set

1. *In this internship, how much did your supervisor care about your well-being?*
 2. *In this internship, how much did your supervisor care about your satisfaction at work?*
 3. *In this internship, how much did your supervisor appreciate the amount of effort you made?*
 4. *In this internship, how much respect did you feel you received?*
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Supervisor Mentoring Scale (SMS)

Supervisor mentoring (McHugh, 2017) is measured with a five-item scale that aims to assess the quality of supervisors' mentoring of interns with specific strategies for achieving career goals. All items are scored with a five-point Likert scale rating from 1 to 5 (1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Very often). The higher scores indicate stronger mentoring received from supervisors.

A confirmatory factor analysis was employed to assess the one-factor structure of SMS. The results showed that $\chi^2(5) = 38.4$, $p < .001$, CFI = .985, TLI = .970, RMSEA = .079 with 90% CI = 0.057 – 0.103, SRMS = .022, indicating that the factor structure provided an excellent estimation. Cronbach's alpha for the scale was .86, indicating good internal reliability.

SMS Item Set

1. *How often did your supervisor suggest specific strategies for achieving career goals?*
 2. *How often did your supervisor encourage you to try new ways of behaving in the job?*
 3. *How often did your supervisor give you feedback regarding job performance?*
 4. *How often did your supervisor give you assignments that presented opportunities to learn new skills?*
 5. *How often did your supervisor help you finish tasks or meet deadlines that otherwise would have been difficult to complete?*
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Developmental Value Scale (DVS)

The Developmental Value Scale consists of ten items that measure the extent to which respondents perceive their internship experience as valuable to their career and academic development. It was created based on a five-item internship developmental value scale proposed by McHugh et al. in 2017, as well as an eleven-item, three-factor scale that evaluates internship related learning outcomes, proposed in 2019 by Nghia and Duyen (McHugh, 2017; Nghia & Duyen, 2019). There are two subscales, namely, academic development value and career development value, and each includes five items. All items are scored with a five-point Likert rating from 1 to 5 (1 = None, 2 = A little, 3 = Some, 4 = Quite a bit, 5 = A great deal). The higher scores indicate better developmental values interns gain from their internship participation.

A confirmatory factor analysis was employed to assess the two-factor structure of DVS. The results showed that $\chi^2(26) = 211.86$, $p < .001$, CFI = .949, TLI = .930, RMSEA = .108 with 90% CI = 0.094 – 0.121; SRMS = .044, indicating that the factor structure provided a generally good estimation, although the RMSEA is a little bit higher than .08. Cronbach's alphas for the

subscales and composite total were all satisfactory, with coefficients of .87 for academic developmental values, .89 for career developmental values, and .93 for the composite total.

DVS Item Set

Academic Developmental Value

1. *This internship helped me to better understand the knowledge I learned in my academic program.*
2. *This internship gave me opportunities to apply what I have learned in my academic program to real-world situations.*
3. *This internship helped me identify my academic knowledge gaps.*
4. *This internship helped me identify what I should focus on studying in my academic program.*
5. *This internship motivated me to look for more hands-on learning opportunities that enhance my academic learning.*

Career Developmental Value

6. *This internship helped me clarify my career goals.*
 7. *This internship provided me with important skills relevant to my career goals.*
 8. *This internship gave me opportunities to learn new career-related skills.*
 9. *This internship helped me to identify specific organizations where I can apply for jobs in the future, perhaps including your internship site.*
 10. *This internship helped me to become more confident in my ability to pursue future career opportunities.*
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Autonomy Scale (AS)

The Autonomy Scale (Beenen & Rousseau, 2010; McHugh 2017) is a two-item scale that measures the degree of flexibility and freedom that an intern has in completing their work during the internship. Participating students rated the two questions using a five-point Likert scale ranging from 1 to 5 (1=None, 2=A little, 3=Some, 4=Quite a bit, 5=A great deal). The higher scores indicate more autonomy during an internship. CFA was not conducted as there are only two items of the scale. Cronbach's alpha for the scale was .77, indicating acceptable internal reliability.

AS Item Set

1. *In this internship, how much flexibility did you have in how you completed your work?*
 2. *In this internship, how much freedom did you have to decide how to do your work?*
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Goal Clarity Scale (GCS)

Goal clarity refers to the extent to which a supervisor provides clear objectives and explanations of the interns' tasks, and is measured with a two-item scale (Beenen & Rousseau, 2010; McHugh, 2017). Each item is scored with a five-point Likert rating from 1 to 5 (1=Not at all clear, 2=A little clear, 3=Somewhat clear, 4=Very clear, 5=Extremely clear). CFA was not conducted in GCS as there are only two items of the scale. Cronbach's alpha of this scale was .86, indicating good internal reliability.

GCS Item Set

1. *In this internship, please rate how clear you felt about the tasks to be completed?*
 2. *In this internship, please rate how clear you felt about the goals to be accomplished?*
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Conclusion

This report provides results of tests of reliability (i.e., Cronbach's alpha) and/or model fit of each scale used in the *College Internship Study* (i.e., Career Adapt-Ability Scale, Supervisor Support Scale, Supervisor Mentoring Scale, Developmental Value Scale, Autonomy Scale and Goal Clarity Scale). Results suggest that all scales have sound psychometric properties with acceptable, good or excellent Cronbach's alphas and adequate model fit indices.

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