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Psychometric Properties of the Career and College Readiness Self-Efficacy Inventory

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Abstract

Believing that one can be successful in postsecondary education endeavors and have a meaningful career are important goals for all students, and school counselors are well positioned to enhance these beliefs. Evidence of construct validity and reliability and recommendations for using the Career and College Readiness Self-Efficacy Inventory (CCRSI) is presented. The CCRSI appears to have potential for core curriculum and individual student planning interventions delivered by professional school counselors to enhance these self-efficacy beliefs.

Keywords: career readiness, college readiness, self-efficacy, adaptability

Sixty-two percent of all the jobs in the United States will require postsecondary education by 2020, and over half of those jobs will require four-year degrees (Dyce, Albold, & Long, 2013). Unfortunately, our nation is not prepared to meet this demand (Lumina Foundation for Education, 2009). Employers around the world are currently finding it difficult to hire individuals who can meet their job requirements (Lumina Foundation for Education, 2009). Moreover, high school diplomas are currently less valuable than in the 20th century, and current youth are confronted with life and career choices demanding knowledge and skills requiring postsecondary education training.

The Career and College Readiness Self-Efficacy Inventory (CCRSI; Baker & Parikh Foxx, 2012) is a product of an intervention program developed to help early adolescents enhance their readiness for the challenges cited above. The intervention was a curriculum delivered by entry-level counseling students to ninth graders in extant English classes. Savickas (2011) recommended that counselors help individuals take possession of their lives in order to discover who they are and decide how to use work in their lives.

The American School Counselor Association's National Model (ASCA; 2012) prioritizes career and college readiness as a goal and career preparation as a function in the school counselor's role. School counseling has strong roots in vocational psychology, and the readiness construct is historically associated with Super's (1990) career maturity concept. Super posited that individuals need to grow through stages of career development and that success in coping with the intra-individual and environmental demands of each stage depends on readiness to cope with those demands. He referred to the level of readiness as career maturity. A more recent synonym for Super's readiness is adaptability (Niles & Harris-Bowlsbey, 2009). Serving students in ways that enhance their readiness for transition from high school to postsecondary education is a traditional function for professional school counselors captured in the ASCA (2012) National Model.

The readiness concept has also been promoted by entities beyond the school counseling profession, and those emphases are having an important influence on the total K–12 education enterprise, including school counseling. Organizations such as Achieve, Inc., ACT, Inc., the American Association of Colleges for Teacher Education, the Bill and Melinda Gates Foundation, the Center for Mental Health in Schools, the College Board, the National Governors Association, and the U.S. Department of Education have each focused attention and funding on efforts to enhance the career and college readiness of school-aged children and youth. The currently popular career and college readiness terminology seems to have corresponded with their efforts. For instance, the ACT (2010) College Readiness assessment focuses on readiness for college by using objectively scored questions about English, mathematics, reading, science, and writing competence. Conley (2010) presented career and college readiness more broadly as a continuum from narrow to broad and from one-dimensional to multidimensional. He defined career ready as possessing the content knowledge and key learning skills and techniques sufficient to begin studies in a career pathway. College ready was defined as being prepared in the key learning skills necessary to succeed in entry-level general education courses (Conley, 2010).

These popular efforts to enhance career and college readiness focus on high quality early education, strong foundational standards in elementary education, rigorous

career and technical education programs, and college completion goals (Achieve, Inc., n.d.). An important element overlooked by the entities presented above is self-efficacy, that is, belief that one can produce the desired results (Bandura, 1997). Enhancing students' career and college readiness self-efficacy is a quest that school counselors are well positioned to address, and core curriculum and individual planning are important functions that provide them with opportunities to achieve this goal.

The self-efficacy construct is a component of Bandura's (1997) social-cognitive theory. According to Bandura (2006): "Efficacy beliefs are the foundation of human agency. Unless people believe they can produce desired results and forestall detrimental ones by their actions, they have little incentive to act or to persevere in the face of difficulties" (p. 10). The broader human agency concept is defined as: "Through cognitive self-regulation, humans can create visualized futures that act on the present; construct, evaluate, and modify alternative courses of action to secure valued outcomes; and override environmental influences" (Bandura, 2006, p. 164). Intentionality, forethought, self-reactiveness, and self-reflectiveness are the core properties of human agency. Consequently, well-intentioned efforts to establish high academic standards, provide rigorous academic coursework, enhance technological competence, and create equitable opportunities for rich educational experiences for all students may fall short of the intended outcomes unless students believe they can manage the financial and procedural challenges associated with postsecondary education, possess the personal characteristics needed for career and college readiness, believe they are competent enough to succeed academically beyond high school, and believe they have the potential to set and achieve future goals.

In their social cognitive career theory, Lent, Brown, and Hackett (1994) posited that career interests are regulated by self-efficacy and outcome expectations. They further assumed that individuals who believe their personal competence is low will also have low outcome expectations and tend to engage in avoidance behaviors. Consequently, if students who have low expectations will avoid engaging in challenging academic coursework, then interventions designed to enhance their career and college readiness self-efficacy may be equally as important as interventions focusing on knowledge and skills acquisition. Gibbons (2004) found that school counselors can help these students by providing interventions that increase their chances for success.

The American School Counselor Association (2013) statement on academic and college/career planning supports Gibbons' (2004) findings. The focus of career planning is presented as helping students make connections between school and life experiences and acquire knowledge and skills needed to be college and career ready upon high school graduation. Elements of the school counselor's role in this process include helping students plan for the future and engage in self-exploration.

The data presented in the remainder of this report provide psychometric information about the CCRSI. Three sets of data are presented: (a) the developmental history of the instrument, (b) exploratory factor analysis and alpha coefficient reliability data, and (c) confirmatory factor analysis and further reliability data.

Developmental History of the Career and College Readiness Self-Efficacy Inventory

The CCRSI was originally designed to evaluate the impact of a career planning program delivered to ninth-grade students enrolled in a gifted and talented baccalaureate

magnet high school in a Southeastern city. The program was a component in a broader effort to help the school develop a postsecondary education going culture.

The career planning program was delivered to ninth-grade students in their extant classrooms by entry-level counselor education students enrolled in their counseling practicums at a local university. A comprehensive meta-analytic study of outcomes from interventions by school counselors by Whiston, Tai, Rahardja, and Eder (2011) supported the curriculum content approach. Content of the curriculum was based on the state department of public instruction's course of study core curriculum for grades 9–12. The curriculum standards included: (a) demonstrating the motivation to achieve individual potential, (b) demonstrating awareness of the education and training needed to achieve career goals, (c) communicating how school success and academic achievement enhance future career and vocational opportunities, and (d) applying study skills necessary for academic success at each level.

Scheduling contingencies at the high school and at the university created the necessity to conduct the curriculum intervention in four 40-minute sessions over a duration of two months, each related to the previous presentation. The goal-based topics covered were: (a) the importance of planning ahead and building aspirations for postsecondary education, (b) developing appropriate study skills, (c) acquiring appropriate attitudes (e.g., desiring to achieve personal success and satisfaction, valuing lifelong learning, and understanding the relationship between education and work), and (d) learning the requisite information about admissions, financial aid, and success in postsecondary education.

The university faculty members coordinating the collaborative relationship between the high school and university developed the original scale for evaluating effects of the program using a pretest/posttest assessment strategy. The pool of items was derived from the goal and content of the curriculum. The item content and scoring system reflect the self-efficacy concept foundations established by Bandura (1997). Sample items are “I believe I have the potential to succeed in the right post high-school education situation” and “I have confidence in being able to live a good life 10 years from now.” Bandura (1997) stated that the methodology for measuring self-efficacy should consist of *can do* rather than *will do* phrasing. The original instrument consisted of 20 items, and it had a 5-point Likert scale ranging from *strongly agree* = 5 to *strongly disagree* = 1. Individual item scores were added together to acquire a total across the items and then divided by the number of items that were answered. The highest possible score was 100 and the lowest was 20.

Exploratory Factor Analysis and Internal Consistencies Reliability Study

Method

Participants. The population for this study was ninth-grade students enrolled in the gifted and talented baccalaureate magnet high school in a Southeastern city, as cited above. Approximately half of the students had been accepted to the magnet school from across the county via a competitive selection process. The remaining students resided in the neighborhood in which the school was located. The socioeconomic status of the neighborhood was relatively low. The total enrollment of the school was approximately 2,700 students. The sample consisted of 359 ninth-grade students enrolled in ninth-grade

English courses that included students from all academic and socioeconomic categories in the school. Fifty-one percent of the enrolled students were White, 35% African American, 12% Asian, and 2% Hispanic. The population of students eligible for free and reduced lunch was 34.6%. In addition, 3.2% were in the Limited English Proficiency category and 1.6% classified in the English as a Second Language status. The university's institutional review board had approved using the instrument to evaluate the effects of the intervention program via pretest and posttest data collected from the participants.

Results

Exploratory factor analysis (EFA). Costello and Osborne's (2005) criterion recommending the ratio of five participants for each scale item was met. A Kaiser-Meyer-Olkin value of .87 and a significant Bartlett's test of sphericity (approx. χ^2 2001.904, *df* 190, *p* = .000) indicated that the data were acceptable for factor analysis. The principal axis factoring extraction method was used (Rotation method = promax [oblique] with Kaiser normalization) via the IBM (2013) Statistics 22 Program. The rotation converged in five iterations. The scree plot provided support for a four-factor model that accounted for 51% of the variance in the items. Fourteen of the 20 items were included in this model. Each of the four factors met Kaiser's position that eigenvalues over 1.00 are stable. Appendix A presents the descriptive statistics and correlations for the EFA, and Table 1 provides factor analysis pattern matrix loadings.

Descriptors based on the four factors were determined next by the investigators. The resulting four descriptors were: (a) Procedural and Financial Challenges (5 items), (b) Positive Personal Characteristics (4 items), (c) Academic Competence (3 items) and (d) Potential to Achieve Future Goals (2 items). Six of the original 20 CCRSI items did not load into the four factors.

Internal consistencies reliability results. The Cronbach alpha reliability coefficient for the total instrument from sample was $r = .857$. The coefficients for the individual factors or sub-scales were as follows: (a) Procedural and Financial Challenges (5 items; $r = .795$), Positive Personal Characteristics (4 items; $r = .687$), Academic Competence (3 items; $r = .752$), and Potential to Achieve Future Goals (2 items; $r = .508$). According to Lee and Lim (2008), coefficient alphas above .70 may be considered as acceptable evidence of internal consistencies reliability. Consequently, the estimates for the total scale and for three of the four sub-scales appear to be very close to or above the acceptable criterion presented by Lee and Lim (2008).

Confirmatory Factor Analysis Study

Method

Participants. The participants were enrolled in required ninth-grade English classes at a rural high school in a Southeastern state (Martinez, Baker, & Young, in press). Forty percent of the schools in the district were eligible for Title I funding, and the high school where the study took place had been designated as low performing by the state board of education. A majority of the students in the school were performing below grade level, and the socioeconomic status of the community was relatively low. Thirty-

Table 1

Exploratory Factor Analysis Pattern Matrix Loadings for the Career College Readiness Self-Efficacy Scale

Items (Numbered) by Factors	Factor 1	Factor 2	Factor 3	Factor 4
<i>Factor 1: Procedural and financial challenges</i>				
I know about the various ways to pay for a post- high school education (17)	.787			
I know how to get the financial aid needed for for post-high school education (5)	.757			
I know how to get the post-high school information I need (4)	.640			
I know I understand the post-high school application process (3)	.627			
I know how much pay for someone’s work it takes to make a good living (15)	.544			
<i>Factor 2: Positive personal characteristics</i>				
There are important influential persons in my life who believe in me (8)		.811		
There are also other persons who can help me achieve my goals (9)		.653		
I know how to set goals for myself (7)		.563		
I have confidence in being able to live a good life 10 years from now (16)		.540		
<i>Factor 3: Academic competence</i>				
I know how to prepare for a test successfully (13)			.826	
I know how to read a textbook successfully (12)			.685	
I know how to take class notes successfully (14)			.683	
<i>Factor 4: Potential to achieve future goals</i>				
I know how post-high school education can help me achieve my life and career goals (1)				.633
I believe I have the potential to succeed in the right post-high school education situation (2)				.452

Note. Boldface correlations indicate the importance of each item to the factor with the influence of the other items partialled out ($N = 359$).

five percent of the school's students were Hispanic, 31% White, 29% African American, 3% multi-racial, 1% Asian, and 1% Asian or Pacific Islander.

Demographics for the sample were as follows. The sample size was $N = 163$. The average age was 14.93 ($SD = .78$). There were 68 (42%) male and 95 (58%) female students in the study. The cultural/ethnic makeup was as follows: Hispanic ($n = 55$; 34%), African American ($n = 47$; 29%), White ($n = 48$; 29%), Multi-race ($n = 10$; 6%), and Asian or Pacific Islander ($n = 3$; 2%).

Instrumentation. The 14-item instrument derived from the exploratory factor analysis was entitled the Career and College Readiness Self-Efficacy Inventory (CCRSI; Baker & Parikh Foxx, 2012). It was later used as a dependent measure in a quasi-experimental study delivered to the sample described above, and the data were used to conduct the confirmatory factor analysis and internal consistencies analyses reported in the present study (Martinez et al., in press).

Results

This confirmatory factor analysis (CFA) tested the factor structure of the 14-item CCRSI (Baker & Parikh Foxx, 2012) resulting from the previous exploratory factor analysis. Four single models were analyzed to determine the strength of each factor and how each item loaded onto each latent variable (StataCorp., 2015). Six models were tested prior to achieving an acceptable fit in the seventh model. Appendix B presents the best-fit model. The suggested cut offs for good fit based on simulations were as follows: Comparative Fit Index (CFI) > 0.95 or > 0.90 and Standardized Root Means Square Residuals (SRMR) $< .008$ root mean squared error of approximation (RMSEA) $< .06$ and a significant χ^2 . The CFI and SRMR are sensitive to different types of model misspecifications. Consequently, using both models provided better information on factor covariances and loadings (Hu & Bentler, 1999). The findings for the best-fit four factor model indicated an adequate fit: $\chi^2(70) = 126.32, p < .001$; CFI = .904. RMSEA = .091; SRMR = .006. The scale reliability integer was .96.

Discussion

Evidence of a consistent factor structure and internal reliability was provided for the CCRSI in the present studies, and the instrument appears to have potential for use in professional practice. The findings suggested that the CCRSI may be a useful assessment instrument for evaluating the effects of planned core curriculum interventions designed to influence attitudes of adolescents toward being constructively focused on careers and postsecondary education beyond high school. As well, the CCRSI may be a useful assessment tool for counselors engaging in individual student planning with adolescents.

Self-efficacy scales tend to be narrowly focused on a specific behavior or set of behaviors, and the CCRSI focuses on the career college readiness concept as defined in the present study. The exploratory factor analysis identified four factors that accounted for 51% of the variance, and the confirmatory factor analysis supported the four-factor model. The resultant factors have potentially defined the content of the career college readiness self-efficacy as consisting of self-efficacy beliefs about (a) meeting procedural and financial challenges associated with postsecondary education and future careers, (b) possessing positive personal characteristics that will enhance readiness, (c) believing that

one possesses the competencies needed to be successful in the future, and (d) also believing that one has the potential to set and achieve future goals. Consequently, these four factors seem to have potential for those seeking to establish goals for interventions designed to enhance career and college readiness.

Limitations

The CCRSI scale is relatively brief, and the literature upon which it is based may have been constricted. Consequently, it may not represent all of the factors that truly make up the career college readiness self-efficacy construct. The factor analysis process has several decision points. Although the decisions were based on sources of expertise, they may have led to findings that would not have been duplicated by other researchers. The process of naming the factors is creative and subjective and open to differences of opinion. Although the item content within each factor was stable, the decisions about how to label them collectively can be open to challenges. Therefore, the descriptors given to the four factors in the present study are creations of the investigators based on their best assessment of the content of the items associated with each factor. Although the population from which the samples were drawn was clearly presented above, external validity is limited somewhat by all the participants having been ninth graders enrolled in two schools in Southeastern metropolitan and rural areas.

Implications for Counseling Practice

Adolescents enrolled in middle schools and junior and senior high schools are the population of greatest interest regarding career and college readiness. Modern adolescents are being confronted with the importance of acquiring training beyond high school to meet the needs of employers and to have meaningful careers and work that pays sufficient salaries and wages (Parikh Foxx, Baker, & Gerler, 2017). Creation of a postsecondary education-going culture is the foundation of preparing modern adolescents to be ready for 21st century careers. Acquisition of the requisite knowledge and skills is truly important. Self-efficacy beliefs are also important and go hand-in-hand with knowledge and skill acquisition. Individuals will be less likely to acquire the necessary levels of knowledge and skills and also less likely to be confident in their ability to be ready for postsecondary education and careers if they do not have sufficient levels of self-efficacy (Bandura, 2006; Lent et al., 1994).

Professional school counselors are positioned and trained to provide both group and individual interventions designed to enhance the career college readiness self-efficacy of youths. The factor structure identified for the CCRSI in the investigations reported herein and the items therein suggest topics that can be the foci of core curriculum interventions, and the instrument can also be used as a pretest and posttest measure of the effects of the interventions on the self-efficacy construct (Parikh Foxx et al., 2017). A singular classroom guidance approach may not work for all participants. Some students may require more substantive presentations of longer duration to be affected. Consequently, both primary and secondary prevention types of core curriculum group interventions may be necessary to meet the differing levels of career college readiness self-efficacy.

Career and college readiness self-efficacy also seems to be important for professional school counselors when engaged in individual student planning sessions

(ASCA, 2012). The four factor categories and the individual items on the CCRSI suggest topics that counselors can plan to address during these sessions. In addition, the instrument can be a source of information before or during the counseling process in order to identify topics needing attention. Students' CCRSI data acquired previous to engaging in individual student planning can be used by counselors to customize the actual planning sessions. For example, some students may be more in need of useful information while others may be more in need of enhancing confidence in their ability to succeed academically in postsecondary education settings.

Recommendations for Future Research

Two avenues of future research come to mind. One avenue is further research on the psychometric properties of the CCRSI, and the second is research using the CCRSI as an outcome measure. A longstanding nostrum among psychological tests and measurement scholars is that one can never have too much validity and reliability evidence for assessment instruments. Consequently, collecting further validity and reliability evidence based on additional investigations of the CCRSI is recommended. Confirmatory factor analyses on different samples and additional reliability estimates will be useful. Test-retest reliability studies will provide a different form of reliability estimate than the internal consistencies approach in the present investigations. Divergent validity studies might be designed to acquire evidence of the uniqueness of the CCRSI as a specific self-efficacy instrument, and convergent validity studies might provide evidence supporting the identification of the CCRSI as a measure of the self-efficacy concept.

The CCRSI has potential as a dependent measure for both program evaluation and between group experimental and quasi-experimental studies in which enhancing career college readiness self-efficacy is a goal of the interventions. It is brief enough to also serve as an outcome measure for single case design experiments in which the goals are to enhance a participant's career college self-efficacy over the course of several individual planning sessions with multiple potential data collection points during the process.

Conclusion

The CCRSI appears to have potential to be a useful source of important data for school counseling practitioners related to career and college readiness. It is not without limitations, and further reliability and validity evidence is recommended. Readiness for careers and college has been touted as a very important 21st century goal. Whether or not 21st century adolescents possess the requisite readiness is a common concern. Self-efficacy is an established indicator of whether or not individuals will succeed at achieving goals and acquiring requisite skills. Therefore, it seems that having a way to assess the self-efficacy of these youths will be an important component of future actions designed to enhance their career college readiness.

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Appendix A

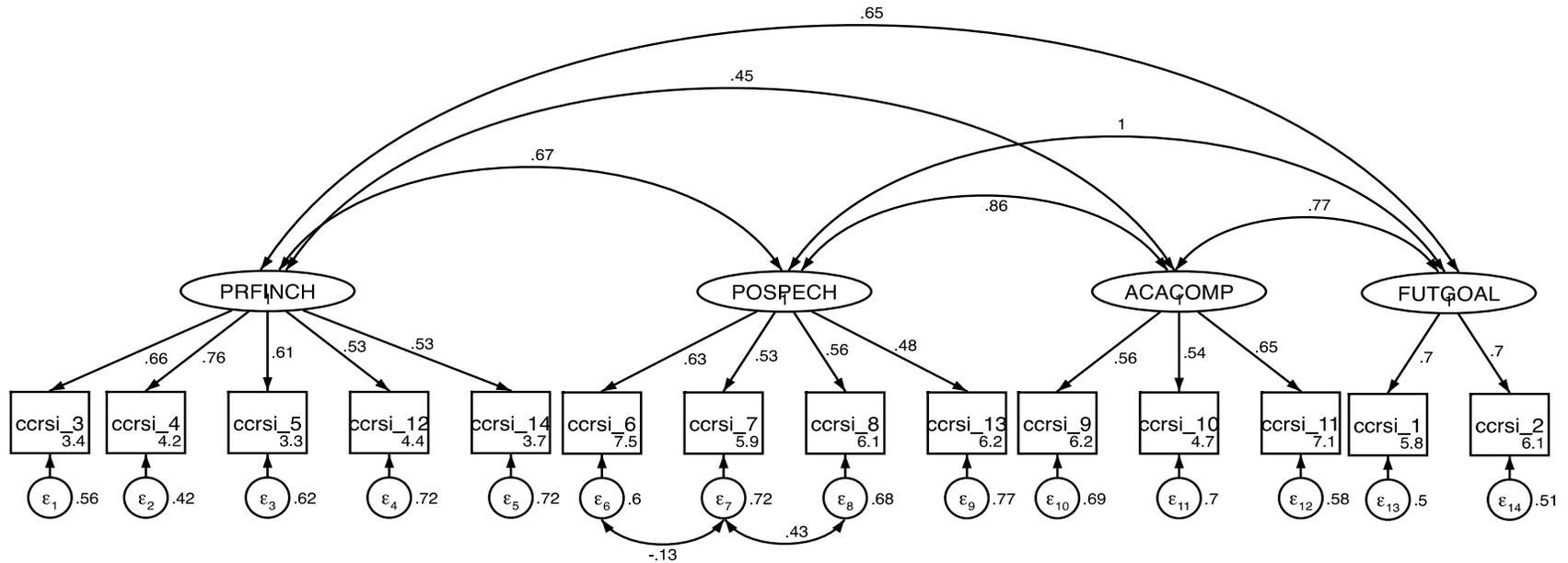
Descriptive statistics and correlations for the CCRSI from the exploratory factor analysis.

	N	M	S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. X1	556	4.34	0.97	-	0.31	0.29	0.21	0.15	0.38	0.15	0.2	0.22	0.17	0.3	0.21	0.2	0.17	0.15	0.15	0.17	0.1	0.29	0.18
2. X2	556	4.48	0.8		-	0.25	0.19	0.15	0.36	0.29	0.34	0.24	0.34	0.29	0.26	0.27	0.21	0.16	0.39	0.18	0.19	0.27	0.32
3. X3	556	3.13	1.14			-	0.6	0.45	0.24	0.26	0.12	0.16	0.25	0.11	0.19	0.15	0.18	0.28	0.24	0.36	0.2	0.23	0.21
4. X4	553	3.1	1.21				-	0.45	0.18	0.17	0.05	0.16	0.17	0.11	0.14	0.12	0.1	0.24	0.13	0.33	0.26	0.24	0.15
5. X5	555	2.93	1.23					-	0.13	0.14	0.07	0.16	0.22	0.06	0.15	0.11	0.09	0.24	0.13	0.44	0.25	0.24	0.13
6. X6	554	4.42	0.87						-	0.34	0.31	0.34	0.34	0.37	0.27	0.22	0.24	0.19	0.37	0.19	0.07	0.23	0.26
7. X7	555	4.26	0.95							-	0.31	0.33	0.42	0.23	0.3	0.34	0.36	0.26	0.38	0.17	0.25	0.22	0.38
8. X8	552	4.39	1								-	0.47	0.25	0.27	0.24	0.17	0.21	0.2	0.34	0.13	0.15	0.18	0.28
9. X9	554	4.29	0.95									-	0.35	0.33	0.25	0.2	0.21	0.24	0.31	0.23	0.16	0.31	0.23
10. X10	552	3.81	1.05										-	0.39	0.35	0.46	0.31	0.31	0.41	0.25	0.15	0.29	0.4
11. X11	553	4.46	0.85											-	0.35	0.4	0.29	0.21	0.35	0.11	0.04	0.19	0.31
12. X12	552	4.2	0.92												-	0.5	0.48	0.3	0.37	0.2	0.19	0.22	0.3
13. X13	552	3.99	0.96													-	0.52	0.3	0.3	0.16	0.15	0.28	0.36
14. X14	551	4.22	0.92														-	0.25	0.31	0.17	0.23	0.25	0.37
15. X15	549	3.58	1.07															-	0.35	0.39	0.31	0.33	0.27
16. X16	548	4.14	1.01																-	0.27	0.17	0.25	0.38
17. X17	549	3.3	1.18																	-	0.46	0.4	0.22
18. X18	550	3.52	1.17																		-	0.32	0.24
19. X19	548	3.76	1.06																			-	0.34
20. X20	549	3.66	1.14																				-

Note. N = non-missing sample size per item, M = mean, S = standard deviation. Pearson product moment correlations are reported in the remainder of the table.

Appendix B

Four Factor Model for Career and College Readiness Self-efficacy Inventory.



Note. PRFNCH = Procedural and Financial Challenges; POSPECH = Positive Personal Characteristics; ACACOMP = Academic Competence; FUTGOAL = Potential to Achieve Future Goals.

$N = 163$. $\chi^2(70) = 126.32, p < .001$; CFI = .904, RMSEA = .091; SRMR = .006