

Introduction

- Communication, critical thinking, continuous learning, collaboration, personal qualities, and technical skills are essential to employment in Canada & US ([Employment and Social Development Canada, 2015](#); [Employment and Training Administration, 2000](#))
- American Psychological Association ([American Psychological Association \[APA\], 2013](#)) has outlined five general skills/knowledge areas needed by undergraduate psychology students: a knowledge base in psychology, scientific inquiry and critical thinking, ethical and social responsibility, communication, and professional development.
- The Employable Skills Self-Efficacy Survey (ESSES) ([Ciarocco & Strohmetz, 2018](#)) evaluates the self-efficacy of psychology students with respect to employable skills: communication, analytic inquiry, collaboration, and professional development.
- Purpose of this study:** To provide additional validity evidence for the ESSES by examining its factor structure, reliability, convergent validity, and discriminant validity.

Methods

Participants

- 170 undergraduate university students:** 136 women (80%); 118 psychology majors (69%); 31 first year students (18%), 51 second year (30%), 42 third year (25%), 38 fourth year (22%), and 8 fifth year or higher (5%).

Materials

- The 51-item **ESSES** is divided into **four domains** and eleven subscales ([Ciarocco & Strohmetz, 2018](#)).
 - The **communication skills domain** includes: writing skills (WS; 4 items), speaking skills (SS; 4 items), reading skills (RD; 4 items), and listening skills (LS; 4 items).
 - The **analytical inquiry skills domain** includes: research skills (RS; 5 items) and information literacy skills (IL; 4 items).
 - The **collaboration skills domain** includes: working in groups skills (WG; 5 items) and leadership skills (LD; 5 items).
 - The **professional development skills domain** includes: self-management skills (SM; 4 items), professional skills (PS; 7 items), and technology (TS; 5 items).
- The **Reading and Writing Self-Efficacy Beliefs Scale** ([Shell et al., 1989](#)). In this study, only the Reading Task subscale (RSE; McDonald's $\omega = .93$), and the Writing Task subscale (WSE; McDonald's $\omega = .91$) were used.
- The **Self-Efficacy for Self-Regulated Learning Scale** (SRLS) ([Zimmerman et al., 1992](#)) (McDonald's $\omega = .89$).
- The **Self-Efficacy for Teamwork and Teamwork Behavior questionnaire** (SET) ([Tasa et al., 2007](#)) (McDonald's $\omega = .92$).
- The 35-item **Information Literacy Self-Efficacy Scale** ([De Meulemeester et al., 2018](#)) (EPI; McDonald's $\omega = .93$) and **Searching and Finding Information Scale** (SFI; McDonald's $\omega = .89$).
- The **New General Self-Efficacy Scale** (GSE) ([Chen et al., 2001](#)) (McDonald's $\omega = .91$).

Procedures

- Data collected anonymously and online in Qualtrics. Eligible students given bonus credit.

Analysis

- Confirmatory factor analysis (CFA):** Model fit was assessed using Chi square (non-significant), the root mean square error of approximation (RMSEA $\leq .08$), the standardized root mean square residual (SRMR $\leq .08$), the comparative fit index (CFI $\geq .90$), and the Tucker-Lewis index (TLI $\geq .90$) ([Anunciação, 2018](#)). Three needed to support fit for model to be accepted.
- Convergent and discriminant validity:** Large ($> .50$), medium ($.30 - .49$), or small ($.10 - .29$) correlations ([Cohen, 1992](#)).

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Results

- CFA did not support the 11-factor structure of the ESSES (Table 1).
- CFAs on each individual scale examined **strict unidimensionality** ([Slocum-Gori et al., 2009](#)) and found that **10 of the 11 subscales** indicated acceptable fit (Table 1). An exploratory factor analysis for the remaining IL scale found a two-factor structure, but the model was not estimable.
- As hypothesized, for **convergent validity**:
 - a large positive correlation between the RSE and **RD subscale**;
 - a medium positive correlation between the WSE and **WS subscale**;
 - a large positive correlation between the SRL and both the **SM subscale** and the **PS subscale**;
 - a medium positive correlation between the SET and **WG subscale** and a large positive correlation between the SET and **LD subscale**; and
 - medium to large correlations between the GSE and **all ESSES subscales** ($r = .33-.55$).
- See Table 2 for correlations and reliabilities.
- We correlated each subscale of the ESSES to the other scales that were not used for the purpose of providing convergent evidence and found **discriminant validity** evidence for the **RD, LD, SM, and PS subscales**.

Table 1

Goodness-of-Fit Indicators of the Models for the ESSES and its Subscales

Scale	df	χ^2	RMSEA	CFI	TLI	SRMR
11 factor ESSES (51 items) ^a	1169	2277*	.07	.72	.69	.09
Writing Skills subscale (4 items)	2	2.67	.04	1.00	.99	.02
Speaking Skills subscale (4 items)	2	6.96*	.12	.97	.90	.03
Reading Skills subscale (4 items)	2	5.23	.10	.96	.86	.04
Listening Skills subscale (4 items)	2	2.02	.01	1.00	1.00	.02
Research Skills subscale (5 items)	5	3.11	.00	1.00	1.01	.02
Information Literacy Skills subscale (4 items) ^a	2	27.10*	.27	.84	.52	.07
Working in Groups Skills subscale (5 items)	5	13.30*	.10	.97	.94	.04
Leadership Skills subscale (4 items)	5	11.70*	.09	.98	.96	.03
Self-Management Skills subscale (4 items)	2	5.59	.10	.96	.87	.04
Professional Skills subscale (7 items)	14	11.90	.00	1.00	1.03	.04
Technology Skills subscale (5 items)	5	3.52	.00	1.00	1.01	.02

^a model-fit criteria not met
* significant, $p < .05$

Table 2

ESSES Reliabilities (McDonald's ω) and Correlations with Other Measures

	ESSES Subscales									
	WS $\omega = .79$	SS $\omega = .74$	RD $\omega = .61$	LS $\omega = .73$	RS $\omega = .83$	WG $\omega = .82$	LD $\omega = .85$	SM $\omega = .63$	PS $\omega = .62$	TS $\omega = .77$
RSE	.32	.45	.56	.44	.49	.30	.42	.36	.44	.37
WSE	.46	.43	.62	.48	.52	.36	.45	.47	.46	.44
SRL	.39	.37	.48	.41	.39	.23	.42	.68	.53	.31
SET	.39	.42	.46	.38	.38	.40	.57	.49	.40	.46
EPI	.35	.45	.58	.44	.56	.30	.34	.41	.40	.45
SFI	.31	.40	.52	.45	.41	.31	.31	.40	.44	.44
GSE	.47	.43	.44	.36	.37	.33	.56	.55	.52	.34

Discussion

- While the items did not support an 11-factor structure, an examination of the individual subscales found support for a single factor solution for 10 of the 11 subscales, providing some positive evidence for the subscales of the ESSES.
- Regarding reliability, only three of the subscales were above the ideal criterion of .80 (RS, WG, and LD), four were above the minimally acceptable criterion of .70 (WS, SS, LS, and TS), and three subscales were below the minimally acceptable criterion (RD, SM, and PS).
- Convergent validity was found via moderate to strong positive correlations with related variables for the RD, WS, SM, PS, WG, and LD subscales. All subscales also correlated moderately to strongly with a general self-efficacy measure. In addition, discriminant validity was found for the RD, LD, SM, and PS subscales.
- Overall, some evidence of validity for the ESSES scores was found. However, revisions are needed to improve the psychometric quality of the scale before using it to measure the skills self-efficacy of psychology undergraduate students.