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Writing Motivation of College Students in Basic Writing and First-Year Composition Classes: Confirmatory Factor Analysis of Scales on Goals, Self-Efficacy, Beliefs, and Affect

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Abstract

The purpose of the study was to validate a writing motivation questionnaire that consists of four scales for first-year college writers—students with low writing skills in basic writing classes and students in typical first-year composition (FYC)—to investigate differences between these two groups and to examine the relationship of motivational constructs with writing quality. Participants were 371 college students (142 in basic writing classes and 229 in FYC). Students completed a 49-item motivation questionnaire with scales for goal-orientation, self-efficacy, beliefs, and affect about writing and wrote an argumentative essay. Confirmatory factor analysis provided evidence for the structural construct validity of all scales for both groups. Statistically significant differences between basic writers and FYC students were found on self-efficacy for grammar and strategies and on beliefs about the importance of substance and mechanics. Structural equation modeling found statistically significant positive relationships of essay quality with all three self-efficacy scales and belief about the importance of substance to good writing, as well as negative relationships with avoidance goal orientation and belief in the importance of mechanics. Limitations and implications for motivation and instruction of basic writing students and of adults with learning disabilities are discussed.

Keywords

motivation, postsecondary, self-efficacy, motivational beliefs, affect, goal orientation, attitude, basic writers, composition

Writing is a cognitively and metacognitively challenging task (Graham, 2018; MacArthur & Graham, 2016). Early research on writing processes revealed its cognitive constraints (Hayes & Flower, 1980) and significant demands on writers' long-term and working memory (McCutchen, 1986). Experimental research on postsecondary students' writing performance and motivation to write is limited (Grubb et al., 2011; Traga Philippakos & MacArthur, 2020), but writing at the postsecondary levels includes specific hurdles for learners. In addition to producing grammatically and syntactically sound sentences and applying foundational skills, students need to write for different purposes, genres, and audiences; identify main ideas to summarize and synthesize; and conduct research, cite their work without plagiarizing, and develop reference lists based on different styles and professional guidelines (e.g., Brownell et al., 2013; Wolfe, 2011). Cognitive overload as well as feelings of cognitive inadequacy or disengagement may result in dropping the writing task or not performing to the best of their ability. Motivation can significantly affect performance on writing tasks and the level of persistence (Bruning & Horn, 2000). Thus, writing is more cognitively and motivationally challenging for low achieving writers who are placed in basic writing classes (Shaughnessy, 1977).

The current study strives to: (a) extend previous research with community college basic writers (BWs) by including first-year composition (FYC) students in an effort to examine the validity of the motivation scales; (b) examine differences between BW and FYC students in motivational

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factors; and (c) investigate the relationship of motivation constructs with writing performance.

Basic Writing

Students who graduate from high school and choose to proceed with postsecondary education may enroll in community colleges or 4-year colleges. Upon completion of their secondary education, learners should be able to effectively apply the writing process to respond to the needs of different audiences, writing purposes, and genres. Furthermore, they should be able to critically read, summarize, conduct research, and evaluate written information; identify main ideas; appropriately cite; and synthesize information as they apply writing with reading skills (National Governors Association and Council of Chief State School Officers, CCSS, 2010). Finally, learners should be able to set goals, work toward their completion, evaluate their progress, reflect and design new goals.

Community colleges generally have open admission policies for all students with high school diplomas. However, students must complete placement exams such as Accuplacer (Vassiliou, 2011) or the ACT (Jones & Gloeckner, 2004) that determine their readiness to proceed with credit-bearing composition courses (Fields & Parsad, 2012). Colleges determine "cut-off" scores, and students who fail placement exams in writing are required to attend noncredit, remedial courses in basic writing, often called developmental writing or developmental English, with the goal of preparing them for success in FYC and later courses (Chen, 2016). A transcript study from the National Center for Educational Statistics (NCES) (Chen, 2016) of students beginning college in 2003 found that 28% of community college students and 11% of 4-year students took basic writing courses. Some colleges have multiple levels of basic writing courses such that students placed in the lowest level have to take a sequence of two or three courses prior to FYC (Perin & Charron, 2006).

Research has shown that students who complete the sequence of basic courses and enroll in related credit courses (e.g., FYC) do as well as students not required to take developmental education (Bahr, 2011), thus meeting an important goal. However, many BWs drop out before completing the course sequence. Students in basic writing classes comprise a large group of students at risk for academic failure, as shown by the data on college dropouts. In addition, placement assessments put them in the lowest quartile of new college students. A study of students referred to developmental English/reading courses found that only 37% of referred students successfully completed a related credit course (Bailey et al., 2010). A study at one minority-serving community college (Nastal, 2019) found that only 12% of students who took the lowest level developmental English course passed FYC. In both studies, most of the dropouts were not due to failing a course but rather to not taking the next course in the sequence or dropping out before even starting the sequence. As shown by the dropout data, BWs face motivational challenges (MacArthur et al., 2015; Perin, 2020). MacArthur et al. (2016) designed and examined a questionnaire measure of motivation with writers who attended lower-level ($n = 45$) and higher-level ($n = 88$) basic writing courses. The results showed that there were statistically significant differences between the two groups on self-efficacy (0–100 Likert-type scale), mastery and performance goals (1–5 Likert-type scale) with writers in the lower level providing lower ratings on self-efficacy and mastery goals and higher ratings on avoidance goals.

Students with learning disabilities (LD) who graduate from high school may proceed with postsecondary or adult education programs. Based on the results of Snyder et al. (2016), 60.9% of adults with LD who graduated in 2012 attended postsecondary education, including 40.8% in 2-year colleges; however, the graduation rate for students with LD in 2-year colleges was 29.4%. Learners with LD tend not to disclose their disability upon entry to postsecondary education (Banks, 2014; National Research Council, 2012); consequently, they do not receive much-needed support. The literacy results of adult learners with LD in the Programme for the International Assessment of Adult Competencies (NCES, 2016) are worrisome. The findings on literacy, numeracy and problem-solving in technology show that they consistently perform less well than their peers ($p < .001$; see Patterson, 2020). With regard to writing, students with LD find the development and organization of ideas challenging as well as the process of rereading to make revisions (Harris et al., 2006. Adult students with LD may also have low expectations about their performance and ability, have low self-esteem, and feel frustrated in their efforts to manage tasks, time, and space (Cortiella & Horowitz, 2014). These feelings can affect their effort and time allotted to tasks as they may need to spend sufficiently more time to complete academic work. Because of the challenges that exist with documentation of learners with LD in basic writing classes, it is not possible to accurately report specific information regarding performance and motivation in postsecondary settings. However, their challenges and motivation resemble the difficulties of other low-performing writers.

Writing Motivation

Writing motivation has been studied using multiple theoretical constructs, including writers' goal orientation, self-efficacy, beliefs, and affect (Hidi & Boscolo, 2006; Pajares & Cheong, 2003; Pajares, 1996; Pajares & Valiante, 2006; White & Bruning, 2005), with the greatest amount of research on self-efficacy (MacArthur & Graham, 2016). Motivation did not receive much attention in the initial

models of writing (Bereiter & Scardamalia, 1987; Hayes & Flower, 1980). However, later research and revisions of those models (Hayes, 1996; Kellogg, 1996) showed that goals, predispositions, and beliefs share a reciprocal relationship with working memory, long-term memory, cognitive processes, and the task environment. Writers' goals and priorities among goals may be the results of beliefs and attitudes they have developed because of specific experiences. Thus, if writers perceive writing performance as an innate ability that cannot change much, they may have negative affect toward it, and through analysis of costs (time, effort) and benefits (higher grade) decide not to devote much time to writing or select a goal to simply produce something (not necessarily their best; Traga Philippakos, 2020). Research on motivation has addressed self-efficacy beliefs (Pajares, 2003) and goal orientation (Elliot, 2007; Elliot & Church, 1997) as well as beliefs about what matters in good writing (White & Bruning, 2005) and affect (Bruning et al., 2013). The following sections discuss research on the four constructs included in the current motivation questionnaire.

Self-efficacy. The term *self-efficacy* refers to writers' beliefs about their ability to successfully complete specific tasks (Bandura, 1982). Students' self-efficacy affects their motivation and their academic performance, and it has been argued that writing instruction should explicitly address self-efficacy (Bruning & Kauffman, 2016). Self-efficacy also affects decision-making processes, effort, and attention (Graham, 2018). Numerous studies have examined the role of self-efficacy in writing performance (Pajares, 2003; Pajares & Valiante, 2001, 2006) Writing self-efficacy research was initiated with the studies of McCarthy et al. (1985), who worked with first-year college students and examined the relationship between writing performance and self-efficacy. Their findings showed that students with higher self-efficacy wrote better quality papers. Subsequent research (Shell et al., 1989) differentiated between self-efficacy for writing tasks and for skills and found that self-efficacy for skills predicted writing performance whereas self-efficacy for writing tasks did not. Furthermore, socio-cognitive theories of self-regulation (Zimmerman & Bandura, 1994) posit that self-efficacy is important in regulating writing tasks. A wide range of studies has revealed a strong relationship between self-efficacy and writing performance (for reviews, see Bruning & Kauffman, 2016; Pajares & Valiante, 2006), but not all research has found such a relationship. A study with college BWs (MacArthur et al., 2016) found no significant correlation, which may have been due to the restricted range of writing quality. Research studies also show that higher apprehension about writing relates to lower self-efficacy (Pajares & Valiante, 2006). Recent work on self-efficacy by Bruning et al. (2013) supported the development of a scale for self-efficacy with high school learners that included ideation, self-regulation, and conventions. Work with postsecondary learners who were BWs identified only one factor (MacArthur et al., 2016); more differentiated factors might be found in a study with a broader range of students.

Goal orientation. Another motivational theory that has been applied to writing is achievement goal theory (Elliot & Church, 1997). The term *goal orientation* refers to learners' tendency to adopt mastery goals, performance goals, and/or avoidance goals (Bipp et al., 2008; Elliot & Church, 1997). Self-efficacy can influence the choice of goals, as individuals with high self-efficacy seek mastery and those with low self-efficacy seek to avoid challenge (Elliot, 2007). *Mastery goals* are focused on understanding, learning, personal growth, and self-improvement (Schunk, 1983, 1990). In contrast, *performance goals* aim at demonstrating improvement compared with others (e.g., receiving higher grades). Finally, *avoidance goals* refer to efforts to avoid failing in front of others and engaging in tasks that learners believe they cannot attain. Research findings have consistently shown that across grades students tend to have lower mastery goals and higher performance goals (Pajares & Cheong, 2003; Pajares et al., 2007) as they seek validation in a grade. Previous work with postsecondary students (MacArthur et al., 2015) showed that after the completion of an intervention that supported students' ability to plan, draft, evaluate to revise, and edit their work in a systematic and methodical manner, and their ability to set goals, manage their use, monitor their progress, and reflect, students in the treatment condition had higher mastery goals compared with their counterparts in the control group, but all students had high-performance goals. The study by (MacArthur et al., 2016) also found positive relationships between performance and mastery goals and negative correlations of avoidance goals with effect and self-efficacy.

Beliefs. Beliefs on *what matters* in writing can affect students' motivation and engagement. Bruning and Horn (2000) asserted that one condition for students' motivation is viewing its value as a social tool for communication as well as a tool for their cognitive growth. White and Bruning (2005) investigated how students' implicit beliefs about writing affected performance. They contrasted *transmissional beliefs*, that the purpose of writing is to transmit knowledge based on what authorities think, with *transactional beliefs*, that writing is a process of learning about a topic through writing and revising. They thought that transactional beliefs would lead to more engagement and attempts to improve writing than transmissional beliefs and found that students who had higher transactional beliefs and lower transmissional beliefs wrote papers of better quality.

Research with BWs (Shaughnessy, 1977) and with students with LD (Graham et al., 1993) has found that these

groups of low-skilled writers tend to emphasize problems with grammar and basic skills, perhaps because those problems are more salient to them than challenges related to generating ideas. Thus, for a study of motivation with college BWs, MacArthur et al. (2016) developed a scale of beliefs about what is important to quality writing that contrasted mechanics/conventions with substantive ideas. Some items from White and Bruning (2005) were adapted for the substantive subscale and new items were written about the importance of mechanics and grammar. The analysis using exploratory factor analysis (EFA) found both factors (MacArthur et al., 2016).

Affect. The term *affect* relates to writers' feelings and attitudes toward writing, which can influence students' writing quality (MacArthur & Graham, 2016). Bruning and colleagues (2013) developed a scale on affect with one factor that referred to liking writing or not. The prior study with BWs (MacArthur et al., 2016) found one factor for affect, which was strongly correlated with self-efficacy and beliefs about the importance of substance/content.

Prior Research and Current Study

MacArthur et al. (2016) designed a motivation questionnaire with four scales for writing goals, self-efficacy, beliefs, and affect and conducted an EFA with community college BWs. Even though beliefs, goals, affect, and self-efficacy are constructs that had been examined with writing, neither prior study had included all scales in one questionnaire nor studied them with BWs. Thus, the goal was to validate the four scales and examine correlations among them. For structural validity, the EFA found three factors for goal orientation (mastery, performance, and avoidance), one factor for self-efficacy, two factors for beliefs (substance and mechanics), and one factor for affect (liking writing). Although the study was designed to capture three separate self-efficacy factors (writing tasks, strategies, and self-regulation), prior research had varied in finding one or multiple self-efficacy factors (for a review, see Bruning & Kauffman, 2016). Contrary to prior research, the study did not find a significant correlation between self-efficacy and writing achievement. However, it did find significant differences between students in higher- and lower-level basic writing classes; as anticipated, students in the lower-level classes had lower self-efficacy ratings and lower mastery goals but higher avoidance goals. The study included only BWs, which is a limitation for two reasons. First, the restricted range of writing proficiency might have limited the sensitivity of the EFA. Second, differences in the motivational constructs are expected between BW and FYC writers, as self-efficacy, goals, beliefs, and affect have all been shown to vary based on writing performance. It is a significant practical limitation if the questionnaire is not valid for a wider range of students.

Thus, the purpose of the present study is to validate the motivation scales from the previous study (MacArthur et al., 2016) with a wider sample that includes both BW and FYC students. The inclusion of a wider range of students and a larger sample is intended to increase the sensitivity of the analysis, validate its use with both BW and FYC students, and increase the usability of the scales in college settings. In addition, we made a few revisions to the scales based on issues raised in the prior research (MacArthur et al., 2016). Specifically, we included items for self-efficacy for mechanics/conventions and revised items on goals that the previous EFA indicated had low loadings. Finally, we conducted a confirmatory factor analysis (CFA) rather than an EFA.

This is a validation study designed to elicit different kinds of validity evidence (American Educational Research Association [AERA], American Psychological Association [APA], & National Council on Measurement in Education [NCME], 2014). Thus, the research questions that guided this investigation were the following:

> **Research Question 1 (RQ1):** What is the evidence of structural validity and internal consistency for the four scales across both groups?

We anticipated confirmation of three factors for goal orientation (mastery, performance, and avoidance), three factors for self-efficacy (tasks and strategies, grammar, and self-regulation), two factors for beliefs (substance and mechanics), and one factor for affect.

> **Research Question 2 (RQ2):** Are there differences in the motivation scores between BW and FYC groups?

Based on prior theory and research on relationships between writing performance and motivational constructs, we hypothesized that FYC students would score higher on mastery goals, all three subscales of self-efficacy, belief in the importance of substance, and affect, but lower on avoidance goals and belief in the importance of mechanics. Confirmation of these hypotheses would support the validity of the scales for sensitivity to developmental differences.

> **Research Question 3 (RQ3):** How do goals, self-efficacy, beliefs, and affect predict writing performance, measured as quality of an essay?

We anticipated positive and negative relationships between subscales and quality based on the same prior findings of

motivation and writing performance. Confirmation would provide evidence of convergent and discriminant validity.

Method

Participants and Setting

The study sample was 371 participants in basic writing (BW) and FYC classes from three colleges across two states. At all colleges, students were placed in BW courses based on scores on the Accuplacer writing tests. The BW courses were required as prerequisites for taking FYC, and the course credits did not count toward graduation. Participants were invited via informed consent. A total of 142 students attended BW classes ($n = 77$ female; 54.2%) and did not take any other college-level courses. Thirty-five (25.0%) were Caucasian, 85 (60.0%) were African American, 5 (3.5%) were Hispanic/Latino, 4 (3.0%) were Asian, and 9 (6.34%) were categorized as Other. The majority of the participants had graduated from high school the prior year (71.0%); 15 (10.56%) spoke a language other than English at home and 22 (15.5%) were born outside the United States. A total of 229 learners attended FYC classes. One hundred forty-three (62.4%) were female, 174 (76.0%) were Caucasian, 19 (8.3%) were African American, 12 (5.24%) were Hispanic/Latino, 8 (3.5%) were Asian, and 9 (7.0%) were identified as Other. For the group of FYC learners, 80% had graduated high school the year before, 21 (9.17%) spoke a language other than English at home, and 19 (8.30%) were born outside the United States. Group equivalences were examined for demographics (gender and ethnicity) using a chi-square test that found statistically significant differences on ethnicity ($p = .001$), but not on gender ($p = .117$). Group equivalences using an ANOVA were also conducted for performance on writing quality and found statistically significant differences between the groups, with BWs writing papers of lower quality compared with FYC learners ($p < .001$).

Measures

Questionnaire. The motivation questionnaire consisted of four scales tapping the four constructs (see the appendix in the online supplementary materials): goal orientation for writing (14 items), self-efficacy for writing (22 items), beliefs about writing (12 items), and affect (five items). The questionnaire was based on the scale used in MacArthur et al. (2016), with the following revisions: Two items were added to the goal orientation subscale for performance, and four items were added to the self-efficacy scale to measure self-efficacy on grammar and conventions. The scale included items adapted from prior research (Bruning et al., 2013; Kauffman et al., 2010) and items written for college BWs. Items for goal orientation on writing used a Likert-type scale of 1 (*does not describe me at all*) to 5 (*describes me perfectly*). Items in self-efficacy for writing were rated on a scale of 0% (*no chance*) to 100% (*completely sure*) with an interval of 10% (Bandura, 2006). Items in both beliefs about writing and affect used a Likert-type scale of 1 (*strongly disagree*) to 5 (*strongly agree*). The goals scale included performance items (e.g., "When writing in this class I am trying to be a better writer than my classmates"), avoidance items (e.g., "When writing in this class I am trying to hide how nervous I am about writing"), and mastery items (e.g., "When writing in this class I am trying to become a better writer"). The self-efficacy scale was designed to measure efficacy subscales for tasks and strategies (e.g., "I can think of a lot of ideas for my writing"; "I can start an essay with an interesting introduction"), grammar (e.g., "I can write complex sentences without making grammatical errors"), and self-regulation (e.g., "I can set goals for improving my writing"). The beliefs scale included subscales on beliefs about the importance of substance (e.g., "Writing helps make my ideas clearer") and mechanics (e.g., "Good writers do not make errors in spelling"). The affect scale did not have a subscale and measured feelings toward writing (e.g., "I think that writing is interesting"). Two negative worded items on affect ("I don't like to write" and "I try to avoid writing as much as possible") were reverse coded so that higher scores meant positive feelings toward writing.

Writing quality measure. Students wrote essays in class. They were given a choice of three argumentative prompts on controversial topics. In prior research (MacArthur et al., 2015; MacArthur & Philippakos, 2013), we had polled instructors and students about interest and knowledge on the topics; we also checked for equivalence in the quality of essays by topic and discarded any topics that differed from others by more than .25 *SD*. The prompts used in the current study asked about cell phones in classrooms, getting a pet from a breeder or the pound, and pay for athletes; the following is a sample:

> Professional athletes in the United States are some of the highest paid people in the world. Some people believe that these athletes' salaries are too high for the work that they do. Others argue that because these athletes are the best in their fields, their talent deserves to be compensated accordingly. **Do you think that professional athletes are overpaid, or do you think they deserve the salaries they are given?** In your essay, state your position and support it with evidence.

Directions and the prompt were read by their instructors; students were asked to spend time planning their work and to complete their responses independently within 45 min. Essays were handwritten, collected by instructors, and shared with the researchers. Graduate students unaware of the purposes of the project typed the papers, retaining all

errors. All papers were independently scored by two research assistants who rated the papers for overall quality on a 7-point scale that examined organization, ideas, sentence clarity, conventions, and word choice; a single holistic score was assigned. Raters were trained by the first and third authors in two meetings until they had acceptable reliability (>70% exact agreement for 100 papers). Interrater reliability was adequate with a correlation of .78 (exact agreement was 69.23%, and within 1 point was 82.0%), which is considered appropriate (correlations of .70–.80 are classified as good; Brown et al., 2004).

Procedures

Administrative. Research staff administered the questionnaire in the second or third week of the semester following explanation of the study and obtaining consent procedures. Students were told that their participation would help better understand the motivation of postsecondary learners and the relationship between motivation and writing quality in order for the research community to better understand how to support students. The administration and completion of the questionnaire took no more than 15 min. Students wrote their essay after the completion of the questionnaire. Students who declined participation wrote the essay for use by the teacher, but the researchers did not collect their data.

Data analytical. Data analyses were conducted within the structural equation model (SEM) framework. To answer RQ1 about structural validity, we used CFA and examined the internal consistency of each subscale (Messick, 1995). The CFAs were conducted separately for each of the four main constructs: goals, self-efficacy, beliefs, and affect. Items from the goals scale specific to grade-related goals (e.g., "When writing in this class I am trying to get a good grade in the class") were removed due to ceiling effects (all participants wanted to receive higher grades.) Internal consistency of participants' responses to each subscale was checked with Cronbach's alpha.

Suggestions for adding paths from observable variables to latent variables were not followed to stay with the theory and to avoid mechanically fitting the model (MacCallum et al., 1992). Measurement invariance between the BW and FYC groups was tested through four steps suggested by Putnick and Bornstein (2016): (a) configural equivalence of model form; (b) metric (weak factorial) equivalence of factor loadings; (c) scalar (strong factorial) equivalence of item intercepts; and (d) residual (strict factorial) equivalence of items' residuals or unique variances. Statistically significant changes in chi-square values relative to the changes in degrees of freedom and changes in comparative fit index (CFI) values of $<-.01$ were used to flag significant differences when testing the measurement invariance models (Cheung & Rensvold, 2002). The comparison of factor means across groups is accepted when configural and metric invariance are both satisfied (Putnick & Bornstein, 2016). The goodness of fit indices included standardized root-mean-square residual, root mean square error of approximation (RMSEA), the CFI, incremental fit index (IFI), and the 90% confidence intervals of RMSEA. This study placed more emphasis on the combinations of multiple goodness-of-fit indices.

To answer RQ2 about differences between the BW and FYC groups, separate MANOVA were run for each scale, with the subscales as variables (e.g., scale for goals with three subscales). Scores for the motivation subscales used in the MANOVA were scores derived by averaging scores across the observed items because the invariance test suggested satisfactory scalar equivalence of item intercepts. Furthermore, to control for the differences between groups on gender and ethnicity and the relationships between age and the outcome variables, MANCOVA were conducted to see if the group differences still existed after the control for the covariates. Effect sizes (η^2) were interpreted using Cohen's (1988) criteria for small (.01), medium (.06), and large (.14).

Finally, to answer RQ3 about how the four motivation constructs predict writing quality, SEM was employed to examine positive and negative relationships of motivation subscales with writing quality. Separate SEM models were tested for each of the four motivation constructs.

Results

Structural Validity and Internal Consistency

CFA was used to test the structural validity of each of the four scales. Table 1 presents goodness-of-fit indices for the full sample and for BW and FYC groups separately. All the goodness-of-fit indices in Table 1 met Hu and Bentler's (1999) two-index presentation strategy except the scale to measure beliefs about the importance of mechanics for FYC writers. Both CFI and IFI were below .90, and the RMSEA value was above the cut-off value of .06. However, some research studies have questioned the validity of Hu and Bentler's (1999) two-index strategy in model fit assessment (Fan & Sivo, 2005), suggesting that this two-index strategy was based on very restrictive assumptions and tended to reject adequately fitting models (Marsh et al., 2004). Therefore, we considered that all models fit adequately in our study.

The results provided evidence for the structural validity of responses to all four motivation scales used in this study. The models are presented in Figures 1 to 4. All the loadings were standardized. The internal consistencies of the factors as measured by Cronbach's alpha were acceptable (Kline, 1999). We calculated overall alpha for self-efficacy as previous research has found a single factor, but we do not

Table 1. Cronbach's Alpha and Fit Indices for the Measurement Model.

Scales	Group	α	χ^2	*df*	CFI	IFI	SRMR	RMSEA	LL	UL
Goals	Basic	.64	43.30	24	.93	.93	.073	.075	.037	.111
	Composition	.75	46.87	24	.95	.95	.079	.082	.046	.117
	All	.71	82.77	24	.92	.92	.062	.081	.063	.101
Efficacy	Basic	.95	407.24	186	.97	.97	.057	.092	.080	.104
	Composition	.93	335.62	186	.97	.97	.061	.075	.062	.088
	All	.95	723.95	186	.97	.97	.052	.088	.082	.095
Substance	Basic	.83	21.12	9	.95	.95	.056	.097	.043	.152
	Composition	.80	7.40	9	.99	.99	.033	.001	.001	.082
	All	.80	20.26	9	.98	.98	.036	.058	.024	.092
Mechanic	Basic	.66	7.66	5	.98	.98	.044	.061	.001	.142
	Composition	.54	17.53	5	.85	.86	.070	.133	.069	.203
	All	.66	11.24	5	.94	.94	.042	.112	.054	.179
Affect	Basic	.86	30.34	5	.94	.94	.059	.189	.128	.256
	Composition	.90	11.09	5	.99	.99	.032	.093	.004	.167
	All	.89	38.76	5	.98	.98	.038	.135	.097	.176

Note. CFI = comparative fit index; IFI = incremental fit index; RMSEA = root mean square error of approximation; SRMR = standardized root-mean-square residual; LL refers to the lower limit, and UL refers to the upper limit, of the 90% confidence interval of RMSEA.

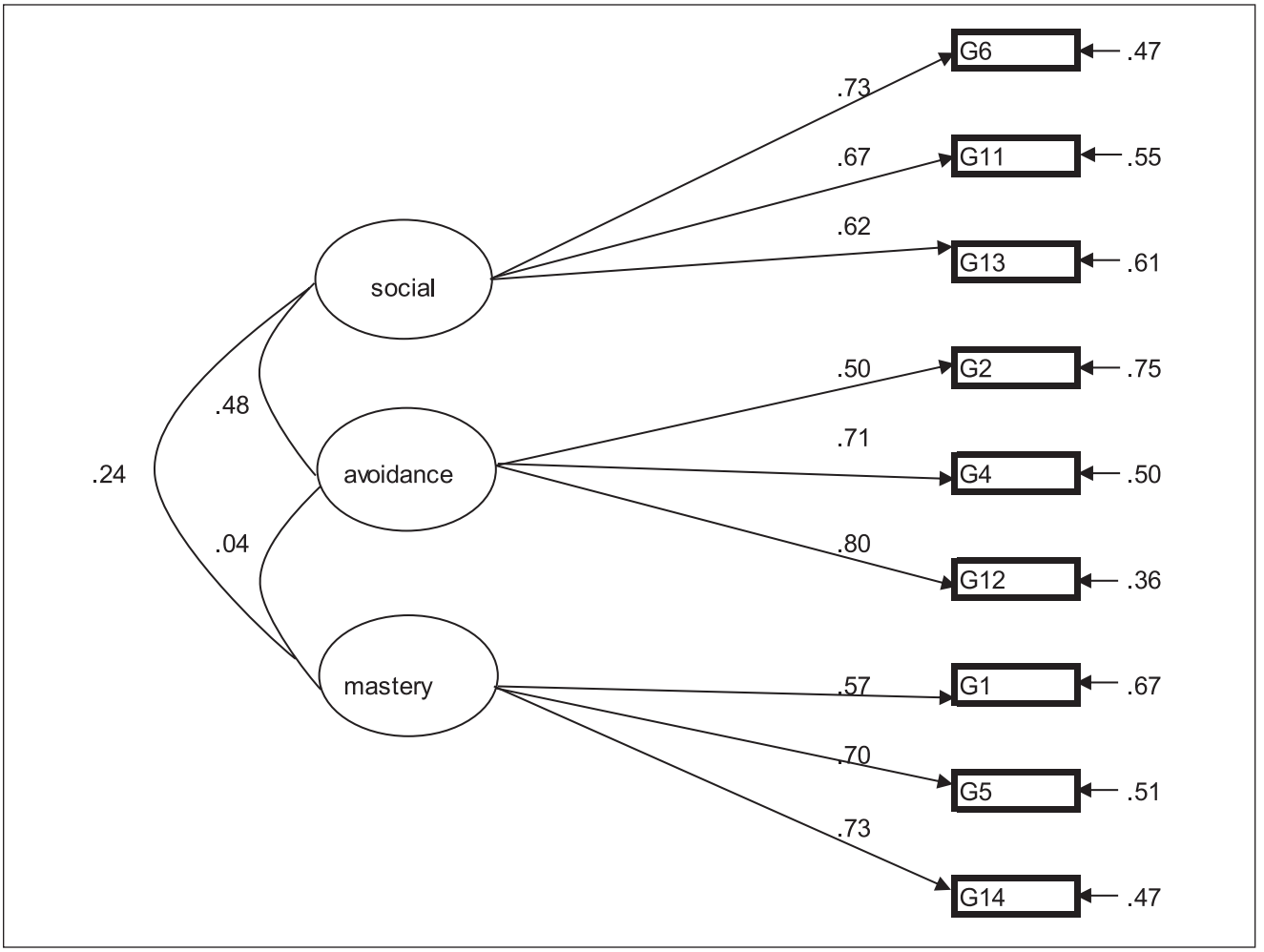

Figure 1. Structure for goals (all writers).
Note. The loadings are standardized.

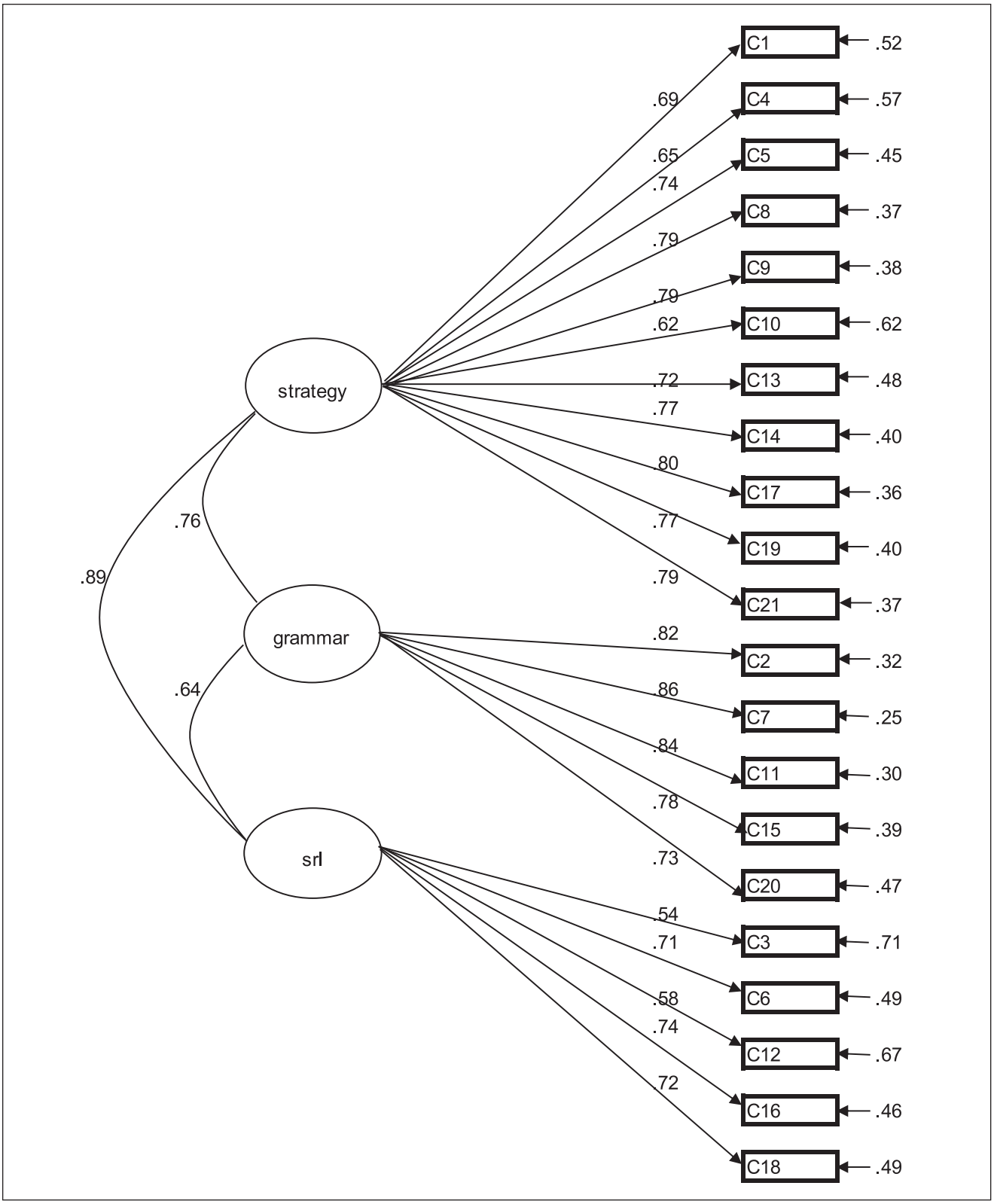

Figure 2. Structure for efficacy (all writers).
Note. The loadings are standardized.

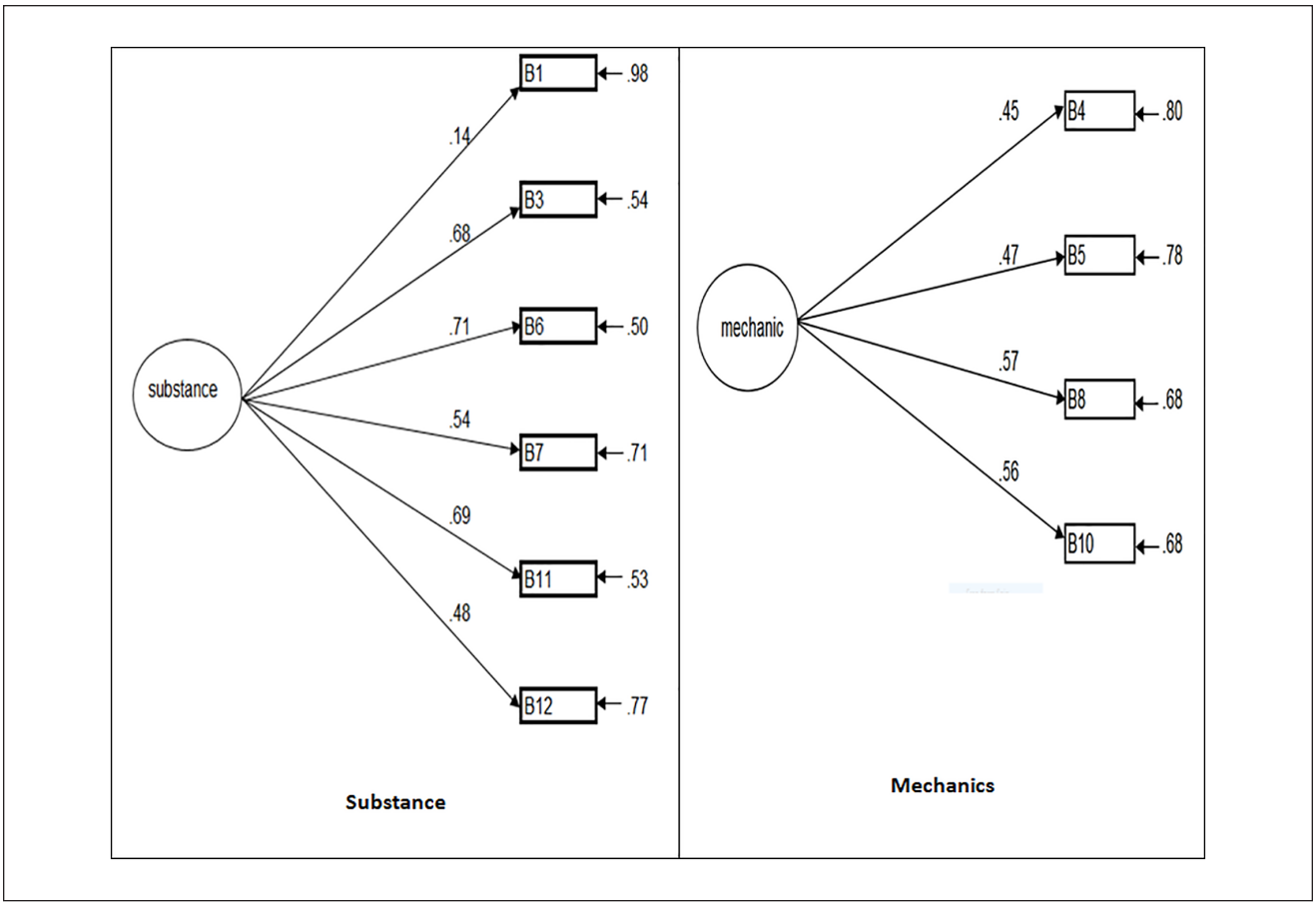

Figure 3. Structure for belief (all writers).
Note. The loadings are standardized.

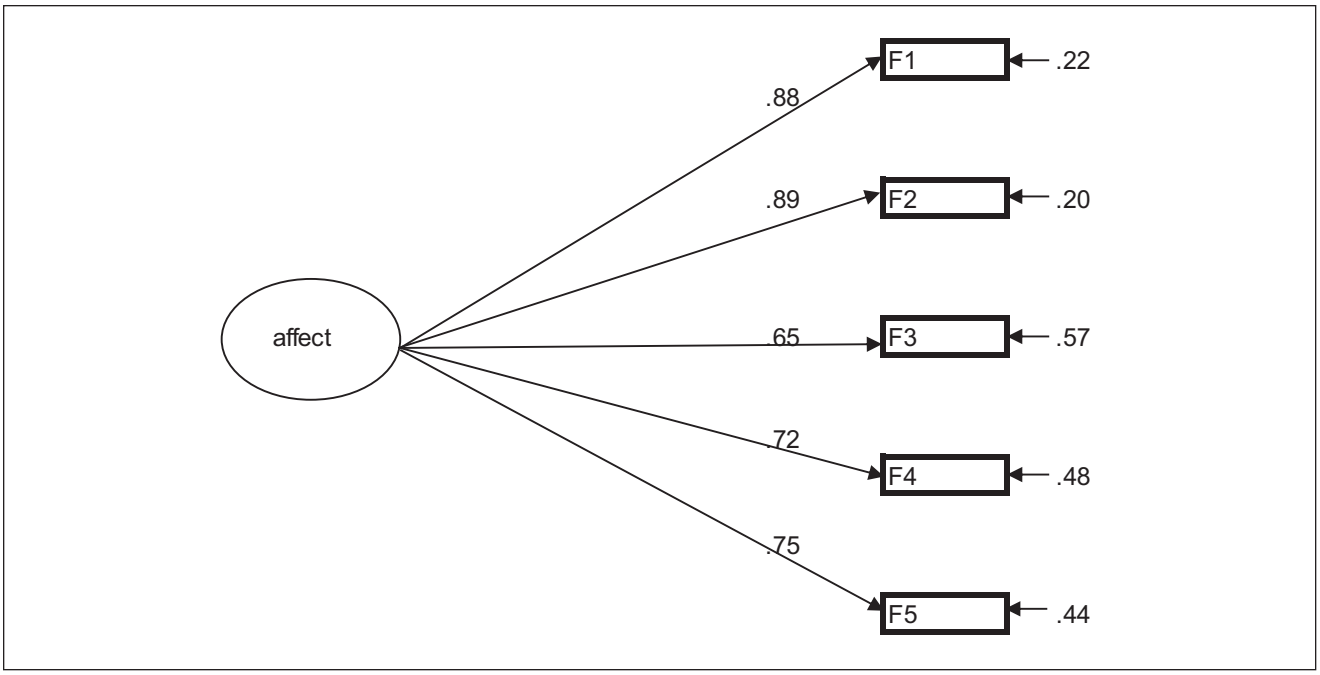

Figure 4. Structure for affect (all writers).
Note. The loadings are standardized.

Table 2. Factorial (Measurement and Structural) Invariance for Goals Between Basic and Composition Writers.

Model	*df*	χ^{2a}	Comparison	Δdf	$\Delta\chi^{2a}$	CFI	ΔCFI[b]	RMSEA
M0	48	120.70				.91		.09
M1	54	132.70	M1–M0	6	12	.91	.00	.09
M2	60	157.73	M2–M1	6	25.03*	.88	–.03	.09
M2P	57	137.95	M2P–M1	3	5.25	.90	–.01	.09
M3	66	210.03	M3–M2P	9	72.08*	.83	–.07	.11
M3P	64	150.76	M3P–M2P	7	12.81	.90	.00	.09

Note. CFI = comparative fit index; RMSEA = root mean square error of approximation; M0 = baseline model (no invariance imposed); M1 = invariant factor loadings; M2 = invariant factor loadings and invariant intercepts; M2P = invariant factor loadings and partially invariant intercepts (free intercepts of G13, G1, and G5); M3 = invariant factor loadings, partially invariant intercepts, and invariant residual variances; M3P = invariant factor loadings, partially invariant intercepts, and partially invariant residual variances (free residual variances of G4 and G12).
[a]Under robust maximum-likelihood estimation. [b]ΔCFI $<-.01$ signals lack of invariance targeted by the respective comparison of nested models.
*$p < .01$.

Table 3. Factorial (Measurement and Structural) Invariance for Efficacy Between Basic and Composition Writers.

Model	*df*	χ^{2a}	Comparison	Δdf	$\Delta\chi^{2a}$	CFI	ΔCFI[b]	RMSEA
M0	372	972.95				.88		.09
M1	390	999.75	M1–M0	18	26.80	.88	.00	.09
M2	408	1,122.60	M2–M1	18	122.85*	.86	–.02	.10
M2P	402	1,022.59	M2P–M1	12	22.84	.88	.00	.09
M3	423	1,098.61	M3–M2P	21	76.02*	.86	–.02	.09
M3P	420	1,052.90	M3P–M2P	18	30.31	.87	–.01	.09

Note. CFI = comparative fit index; RMSEA = root mean square error of approximation; M0 = baseline model (no invariance imposed); M1 = invariant factor loadings; M2 = invariant factor loadings and invariant intercepts; M2P = invariant factor loadings and partially invariant intercepts (free intercepts of C15, C16, C1, C12, C17, C9, and grammar); M3 = invariant factor loadings, partially invariant intercepts, and invariant residual variances; M3P = invariant factor loadings, partially invariant intercepts, and partially invariant residual variances (free residual variances of C1, C2, and C11).
[a]Under robust maximum-likelihood estimation. [b]ΔCFI $< -.01$ signals lack of invariance targeted by the respective comparison of nested models.
*$p < .01$.

report an overall alpha for goal orientation and beliefs as the subscales are not intended to measure the same constructs. Thus, for goal orientation, alphas were .72, .69, and .71 for the factors of social performance, avoidance, and mastery orientations, respectively. For self-efficacy, Cronbach's alphas were .95 for responses to all items and .93, .90, and .79 for the factors of self-efficacy for strategy use, grammar, and self-regulation, respectively. For beliefs, alphas were .80 and .66 for responses to items used to measure the factors of beliefs about the importance of substance and mechanics, respectively. For affect, Cronbach's alpha was .89 for all items.

Measurement Invariance Between Basic and Composition Writers

Four models were assessed to follow the four steps suggested by Putnick and Bornstein (2016): Model 0 for configural invariance; Model 1 for metric equivalence of factor loadings; Model 2 for scalar equivalence of item intercepts; and Model 3 for residual invariance. Goodness-of-fit indices for the four models (including partially invariant models) are presented in Tables 2 to 6 for the constructs of goals, efficacy, beliefs about the importance of substance to quality writing, beliefs about the importance of mechanics to quality writing, and affect.

Configural and metric invariance was met for all latent constructs. Complete scalar invariance was met for the constructs of beliefs about the importance of substance to quality writing and affect only. Partially scalar invariance was met for the constructs of goals, efficacy, and beliefs about the importance of mechanic to quality writing. Similarly, complete residual invariance was met for the measurement of beliefs about the importance of substance to quality writing only. The measurement of goals, efficacy, beliefs about the importance of mechanic to quality writing, and affect was partially invariant with respect to residuals. Testing for residual invariance; however, is not a prerequisite for mean comparisons because residuals are not part of the latent factor (Vandenberg & Lance, 2000).

Differences in Motivation Between BW and FYC Students

Differences between BW and FYC students were investigated to evaluate the sensitivity of the motivation scales to

Table 4. Factorial (Measurement and Structural) Invariance for Substance Between Basic and Composition Writers.

Model	*df*	χ^{2a}	Comparison	Δdf	$\Delta\chi^{2a}$	CFI	ΔCFI[b]	RMSEA
M0	9	19.98				.98		.08
M1	14	27.14	M1–M0	5	7.16	.97	–.01	.07
M2	18	37.09	M2–M1	4	9.95	.96	–.01	.08
M3	23	45.59	M3–M2	5	6.91	.95	–.01	.07

Note. CFI = comparative fit index; RMSEA = root mean square error of approximation; M0 = baseline model (no invariance imposed); M1 = invariant factor loadings; M2 = invariant factor loadings and invariant intercepts; M3 = invariant factor loadings, partially invariant intercepts, and invariant residual variances; M4 = invariant factor loadings, partially invariant intercepts, and invariant factor variances and covariances.
[a]Under robust maximum-likelihood estimation. [b]ΔCFI $< -.01$ signals lack of invariance targeted by the respective comparison of nested models.
*$p < .01$.

Table 5. Factorial (Measurement and Structural) Invariance for Mechanic Between Basic and Composition Writers.

Model	*df*	χ^{2a}	Comparison	Δdf	$\Delta\chi^{2a}$	CFI	ΔCFI[b]	RMSEA
M0	3	27.89				.85		.21
M1	7	30.24	M1–M0	4	2.35	.86	.01	.13
M2	10	70.11	M2–M1	3	39.87*	.64	–.02	.18
M2P	8	34.26	M2P–M1	1	4.02	.85	–.01	.13
M3	12	51.83	M3–M2P	4	17.57*	.76	–.02	.13
M3P	11	40.57	M3P–M2P	3	6.31	.82	–.03	.12

Note. CFI = comparative fit index; RMSEA = root mean square error of approximation; M0 = baseline model (no invariance imposed); M1 = invariant factor loadings; M2 = invariant factor loadings and invariant intercepts; M2P = invariant factor loadings and partially invariant intercepts (free intercepts of B4 and B8); M3 = invariant factor loadings, partially invariant intercepts, and invariant residual variances; M3P = invariant factor loadings, partially invariant intercepts, and partially invariant residual variances (free residual variances of B10); M4 = invariant factor loadings, partially invariant intercepts, and invariant factor variances and covariances.
[a]Under robust maximum-likelihood estimation. [b]ΔCFI $< -.01$ signals lack of invariance targeted by the respective comparison of nested models.
*$p < .01$.

Table 6. Factorial (Measurement and Structural) Invariance for Affect Between Basic and Composition Writers.

Model	*df*	χ^{2a}	Comparison	Δdf	$\Delta\chi^{2a}$	CFI	ΔCFI[b]	RMSEA
M0	9	49.67				.96		.16
M1	14	50.87	M1-M0	5	1.20	.97	.01	.12
M2	18	51.53	M2-M1	4	0.66	.97	.00	.10
M3	23	73.18	M3-M2	5	21.65*	.95	–.01	.11
M3P	21	58.96	M3P-M2	3	7.43	.97	.00	.10

Note. CFI = comparative fit index; RMSEA = root mean square error of approximation; M0 = baseline model (no invariance imposed); M1 = invariant factor loadings; M2 = invariant factor loadings and invariant intercepts; M3 = invariant factor loadings, partially invariant intercepts, and invariant residual variances; M3P = invariant factor loadings, partially invariant intercepts, and partially invariant residual variances (free residual variances of F2).
[a]Under robust maximum-likelihood estimation. [b]ΔCFI $< -.01$ signals lack of invariance targeted by the respective comparison of nested models.
*$p < .01$.

differences between the two groups with different levels of writing development. Correlations among the motivation subscales and writing quality and descriptive statistics for the two groups are presented in Tables 7 to 9.

Goals. MANOVA results for the comparison between basic and composition writers on the linear combination of the three subscale scores of goal orientation (i.e., social performance, avoidance, and mastery) revealed no statistically significant differences, Wilks' lambda = .99, $F(3, 367) = 1.47$, $p = .22$, $\eta^2 = .01$. Statistically significant correlations were found between age and social performance ($r = -.13$, $p < .01$) and age and mastery ($r = -.11$, $p = .04$). These statistically significant relationships justified the use of age as a covariate in the MANOVA. In addition to this covariate, the MANCOVA model also included students' gender and ethnicity (coded as minority vs. European American) as independent variables because there were differences in the composition of the two groups of writers. Results again showed no statistically significant differences between BW

Table 7. Relationships Between Latent Constructs for Basic and Composition Writers.

Scale	Subscale	a	b	c	d	e	f	g	h	i	j
Goal orientation	Social performance (a)	—	.28**	.07	–.02	.09	–.02	.04	.39*	–.05	.13
	Avoidance (b)	.42**	—	.02	–.32**	–.24**	–.30**	.05	.13	–.31**	–.06
	Mastery (c)	.23**	.07	—	.02	.14	.09	.19*	.02	.08	.34**
Self-efficacy	Strategies (d)	.18**	–.32**	.25**	—	.79**	.81**	.31**	–.17*	.47*	.14
	Grammar (e)	.09	–.29**	.36**	.58**	—	.63**	.15	–.02	.34**	.14
	Self-regulation (f)	.11	–.23**	.29**	.77**	.55**	—	.34**	–.09	.45**	.17*
Beliefs	Substance (g)	.03	–.31**	.31**	.47**	.23**	.47**	—	.08	.46**	.18*
	Mechanics (h)	.18**	.25**	–.14*	–.19**	–.08	–.08	–.20**	—	–.02	–.01
Affect	Affect (i)	.11	–.30**	.25**	.45**	.26**	.45**	.60**	–.12	—	.16
Quality	Quality (J)	.22**	.06	.12	.10	.03	.08	.11	–.04	–.05	—

Note. Coefficients above the diagonal are for basic writers whereas those under the diagonal are for composition writers.
*$p < .05$ (two tailed). **$p < .01$ (two tailed).

Table 8. Relationships Between Latent Constructs for All Writers.

Scale	Subscale	a	b	c	d	e	f	g	h	i	j
Goal orientation	Social performance (a)	—	.36**	.16**	.08	.09	.06	.03	.27**	.05	.18**
	Avoidance (b)		—	.06	–.33**	–.28**	–.26**	–.16**	.21**	–.28**	.01
	Mastery (c)			—	.12*	.24**	.22*	.27**	–.06	.20**	.21**
Self-efficacy	Strategies (d)				–	.70**	.46**	.37**	–.21**	.40*	.12*
	Grammar (e)					—	.56**	.17**	–.10	.24**	.08
	Self-regulation (f)						—	.42**	–.08	.45**	.11*
Beliefs	Substance (g)							—	.06	.55**	.14**
	Mechanics (h)								—	–.05	–.03
Affect	Affect (i)									—	.03
Quality	Quality (J)										—

*$p < .05$ (two tailed). **$p < .01$ (two tailed).

Table 9. Descriptive Statistics for BW and FYC Writers.

		Basic (BW)		Composition (FYC)	
Scale	Subscale	*M*	*SD*	*M*	*SD*
Goals	Social performance	3.00	1.08	3.00	0.97
	Avoidance	2.48	0.98	2.32	0.92
	Mastery	4.36	0.65	4.27	0.63
Self-efficacy	Strategies**	69.06	18.56	76.18	13.69
	Grammar**	62.13	21.33	73.17	18.21
	Self-regulation	71.99	16.57	71.97	16.53
Beliefs	Substance	4.01	0.59	3.94	0.57
	Mechanics**	2.51	0.75	2.25	0.62
Affect	Affect*	3.45	0.86	3.16	0.92
Quality	Writing Quality**	2.42	0.99	3.86	1.20

Note. Scale range for goals, beliefs, and affect: 1 (*strongly disagree*) to 5 (*strongly agree*); scale range for self-efficacy 0 (*no chance*) to 100 (*completely sure*); quality scores based on a 7-point holistic scale. BW = basic writing; FYC = first-year composition.
*$p < .01$. **$p < .001$.

and FYC writers on the linear combination of the three factors of motivation (i.e., social performance, avoidance, and mastery), Wilks' lambda = .99, $F(3, 360) = 0.56$, $p = .64$, $\eta^2 = .01$. Tests of between-subjects effects showed that female students ($M = 4.36$, $SD = .62$) reported significantly higher levels of mastery goal orientation than male students ($M = 4.23$, $SD = .66$), $F(1, 362) = 4.53$, $p = .03$, $\eta^2 = .01$. No significant effects were found by ethnicity.

Self-efficacy. MANOVA results for the comparison between BW and FYC writers on the linear combination of the three subscales of self-efficacy (i.e., strategy, grammar, and self-regulation) revealed statistically significant differences, Wilks' lambda = .86, $F(3, 367) = 20.31$, $p < .001$, $\eta^2 = .14$. Statistically significant correlations were found between age and self-efficacy for strategies ($r = -.20$, $p < .001$) and age and self-efficacy for grammar ($r = -.26$, $p < .01$). These statistically significant relationships justified the use of age as a covariate in the MANOVA for the differences in self-efficacy between BW and FYC writers. In addition to the covariate, the MANCOVA model also included students' gender and ethnicity (coded as minority vs. European American) as independent variables. Results again showed statistically significant differences between basic and composition writers on the linear combination of the three subscales of self-efficacy (i.e., strategy, grammar, and self-regulation), Wilks' lambda = .90, $F(3, 360) = 13.91$, $p < .001$. $\eta^2 = .10$. The differences related to student gender and ethnicity were not statistically significant, $p > .05$.

Tests comparing FYC and BW students found statistically significantly different self-efficacy in the use of strategies, $F(1, 362) = 14.37$, $p < .001$, $\eta^2 = .04$, as well as in the use of grammar, $F(1, 362) = 14.22$, $p < .001$, $\eta^2 = .04$ (see Table 9 for descriptive data). The differences in the self-efficacy for self-regulation, however, were not statistically significant, $F(1, 362) = 0.001$, $p = .98$, $\eta^2 < .001$. No statistically significant differences were noted in any one of these three subscales of self-efficacy with respect to gender or ethnicity ($p > .05$).

Beliefs. As the relationship between beliefs about the importance of substance and beliefs about the importance of mechanics was not statistically significant, $r = .04$, $p > .05$, separate analyses of variance were used to compare BW and FYC writers on the two sub- of beliefs (i.e., substance and mechanics).

Substance. No statistically significant differences were noted in beliefs about the importance of substance, $F(1, 369) = 1.37$, $p = .24$, $\eta^2 = .004$. A statistically significant correlation was found between age and belief in the importance of substance ($r = .13$, $p < .05$). This statistically significant relationship justified the use of age as a covariate in the ANOVA. In addition to the covariate, the ANCOVA model also included students' gender and ethnicity (coded as minority vs. European American) as independent variables. Results again showed no statistically significant difference between basic and composition writers on beliefs about the importance of substance, $F(1, 362) = 0.07$, $p = .80$, $\eta^2 < .001$. Tests of between-subjects effects showed that female students ($M = 4.04$, $SD = .59$) reported significantly higher on beliefs about the importance of substance than male students ($M = 3.85$, $SD = .53$), $F(1, 362) = 5.96$, $p = .02$, $\eta^2 = .02$. No statistically significant difference was noted by ethnicity, $F(1, 362) = 1.72$, $p = .19$, $\eta^2 = .005$.

Mechanics. A statistically significant difference was noted between BW and FYC writers on beliefs about the importance of mechanics, $F(1, 369) = 13.26$, $p < .001$, $\eta^2 = .04$. BWs ($M = 2.51$, $SD = .75$) reported higher levels of beliefs about the importance of mechanics than composition writers ($M = 2.25$, $SD = .62$). As the relationship between age and beliefs about the importance of mechanics was not statistically significant, $r = .04$, only gender and ethnicity were entered into the ANOVA model. ANOVA results showed no statistically significant difference related to student ethnicity, $F(1, 363) = 0.86$, $p = .36$, $\eta^2 = .002$. The main effect related to gender was still statistically significant after the control of student ethnicity, $F(1, 363) = 3.73$, $p = .01$, $\eta^2 = .02$. Male writers ($M = 2.48$, $SD = .74$) reported higher levels of beliefs about the importance of mechanics than female writers ($M = 2.26$, $SD = .63$).

Affect. A statistically significant difference was found between basic and FYC writers on affect, $F(1, 369) = 9.27$, $p = .002$, $\eta^2 = .03$. BWs ($M = 3.45$, $SD = .86$) reported higher levels of affect than FYC writers ($M = 3.16$, $SD = .92$).

The correlation between students' age and affect was statistically significant ($r = .11$, $p < .05$). This statistically significant relationship justified the use of age as a covariate in the ANOVA. In addition to the covariate, the ANCOVA model also included students' gender and ethnicity (coded as minority vs. European American) as independent variables. Results showed no statistically significant differences related to gender, $F(1, 362) = 3.10$, $p = .08$, $\eta^2 = .008$, or ethnicity, $F(1, 362) = 1.42$, $p = .24$, $\eta^2 = .004$.

Relationships Between Writing Quality and Motivation

Relationships between motivation and writing quality were investigated to see if positive and negative relationships with subscale constructs were consistent with theory. Separate SEM models for the four motivation scales detected specific statistically significant relationships with writing quality for all four constructs (see Table 10). All SEM models included consideration of error and used standardized loadings.

The SEM model for goal orientation showed a statistically significant negative relationship ($\beta = -.15$) between avoidance goals and writing quality (see Figure 5). The relationships between writing quality and the social performance and mastery goals were not statistically significant ($p > .05$).

The SEM model for self-efficacy showed statistically significant positive relationships between writing quality and self-efficacy for strategy use ($\beta = .11$), self-efficacy for

Table 10. Fit Indices for the Structural Equation Model Related to Writing Quality.

Scale	χ^2	*df*	CFI	IFI	SRMR	RMSEA	LL	UL
Goals	142.20	33	.87	.87	.12	.099	.08	.12
Efficacy	1,158.42	207	.94	.94	.31	.116	.11	.12
Beliefs	133.15	53	.92	.92	.06	.067	.05	.08
Affect	41.52	9	.97	.97	.04	.103	.07	.14

Note. CFI = comparative fit index; IFI = incremental fit index; SRMR = standardized root-mean-square residual; RMSEA = root mean square error of approximation; LL refers to the lower limit, and UL refers to the upper limit, of the 90% confidence interval of RMSEA.

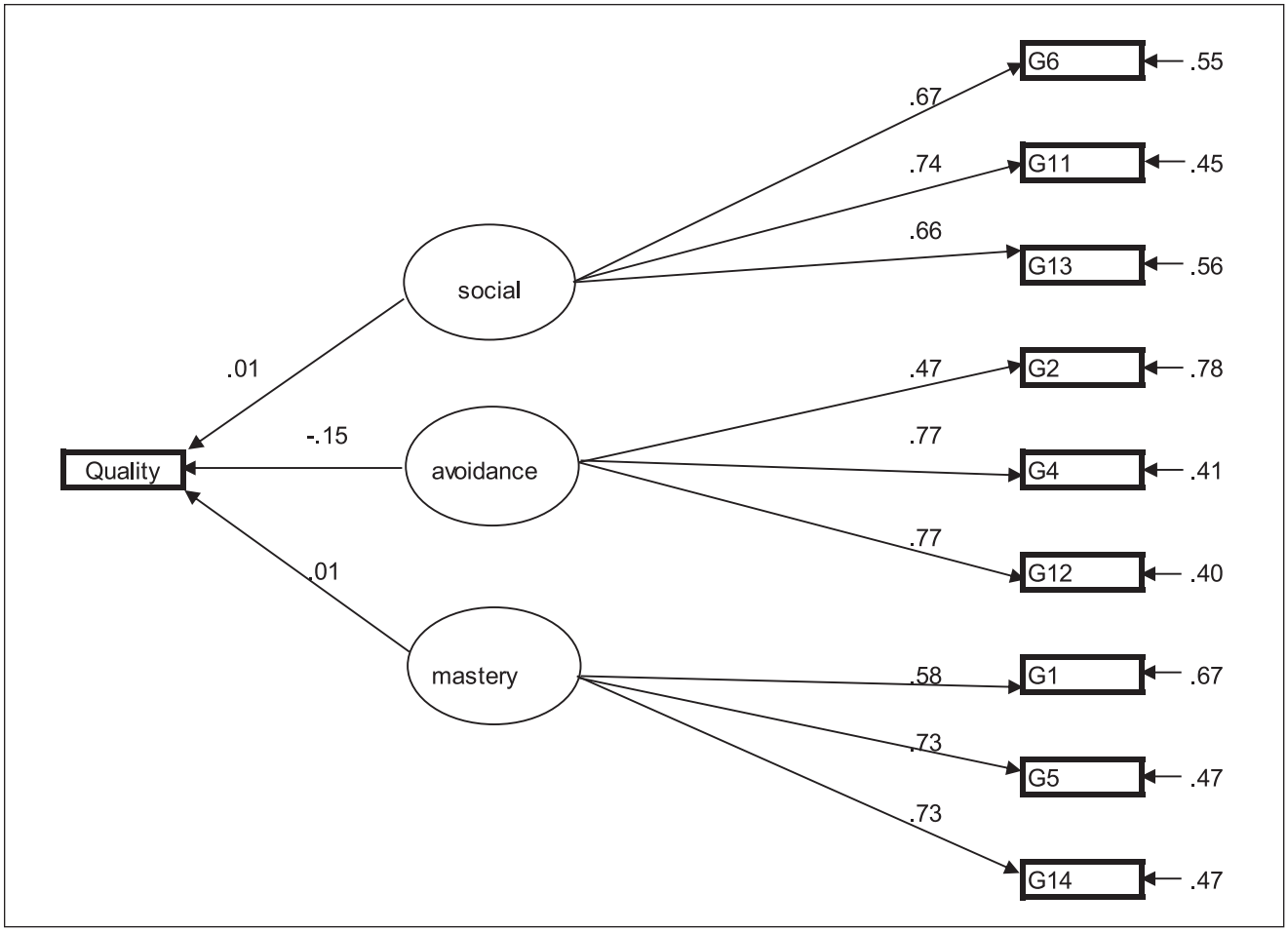

Figure 5. Standard error of measurement for the relationship between goal and writing quality factors.
Note. The loadings are standardized.

grammar use (β = .13), and self-efficacy for self-regulation (β = .13; see Figure 6).

The SEM model for beliefs showed a statistically significant positive relationship between writing quality and beliefs about the importance of substance (β = .17), and a statistically significant negative relationship between writing quality and beliefs for mechanics (β = −.14; see Figure 7).

The SEM model for affect showed that the relationship between writing quality and affect was not statistically significant ($p > .05$; see Figure 8).

Discussion

The purpose of the current study was to validate a motivation questionnaire for first-year college writers including both BW and FYC students. The questionnaire includes four scales: goal orientation, self-efficacy, beliefs, and affect. The study addressed the structural validity, construct validity, and convergent validity of each scale (AERA et al., 2014) and found that the scales are structurally valid for both groups, sensitive to group differences, and related to writing quality in theoretically consistent ways.

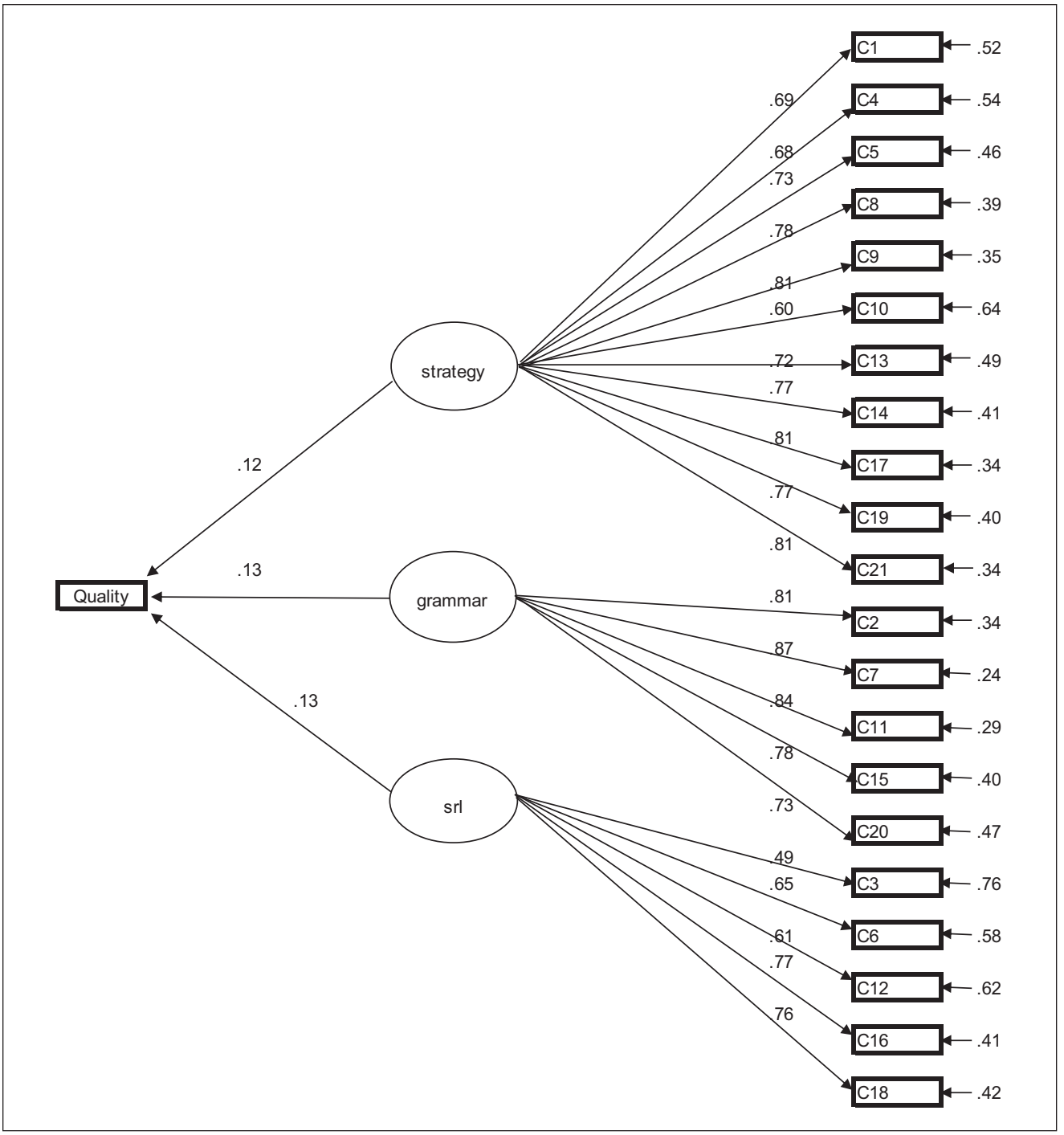

Figure 6. Standard error of measurement for the relationship between the self-efficacy and writing quality factors.
Note. The loadings are standardized.

For goal orientation, the results are consistent with theory (Elliot & Church, 1997; Elliot, 2007) and prior research in writing motivation (Kauffman et al., 2010; MacArthur et al., 2016; Pajares & Cheong, 2003) in finding three goal orientations: performance, mastery, and avoidance goals. For self-efficacy, the model differentiated among self-efficacy for grammar, strategies, and self-regulation as anticipated. Prior research on self-efficacy for writing has varied in the number of separate factors found (for reviews, see Bruning & Kauffman, 2016; Pajares & Valiante, 2006). Our prior study (MacArthur et al., 2016) with just BW found only a single factor for self-efficacy, which may have

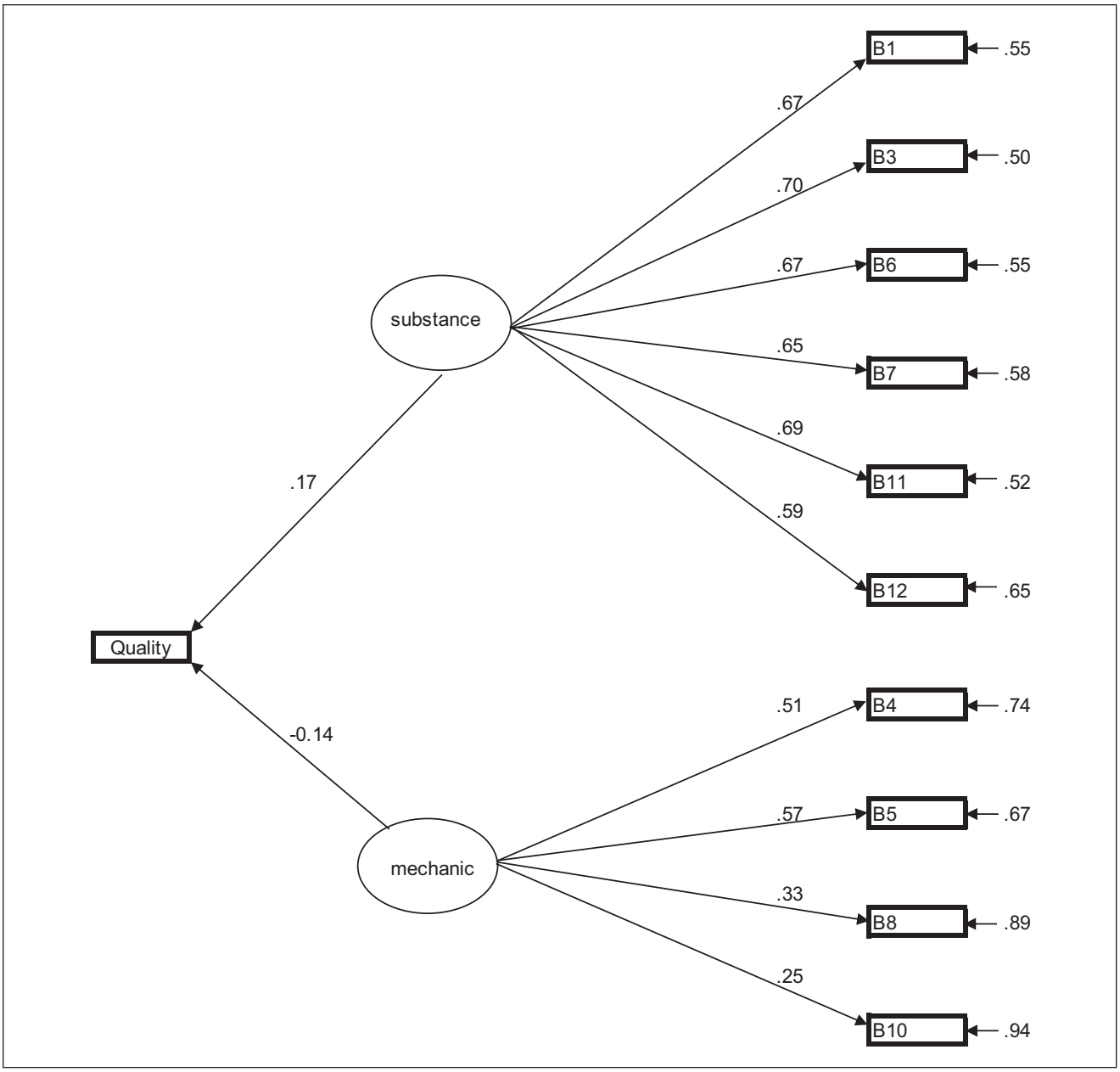

Figure 7. Standard error of measurement for the relationship between the beliefs and writing quality factors.
Note. The loadings are standardized.

been due to a restricted range of writing skill in the sample. For beliefs about what is important to good writing, the model found the two anticipated subconstructs, substance and mechanics, as in our prior study (MacArthur et al., 2016); Relatively little prior research has attempted to measure beliefs about what is important in writing (White & Bruning, 2005), and to our knowledge, no studies other than our two have contrasted beliefs about substance and mechanics. However, theory and research support the idea that low achieving writers, both BW (Shaughnessy, 1977) and students with LD (Graham et al., 1993), place excessive emphasis on conventions and mechanics in ways that undermine motivation.

In comparing the BW and FYC groups, we anticipated that the results would align with prior theory and research on relationships among motivational constructs and writing performance. Thus, as research has found positive relationships between writing performance and mastery goals (Kauffman et al., 2010), self-efficacy (Bruning & Kauffman, 2016; Pajares & Valiante, 2006), and belief in the

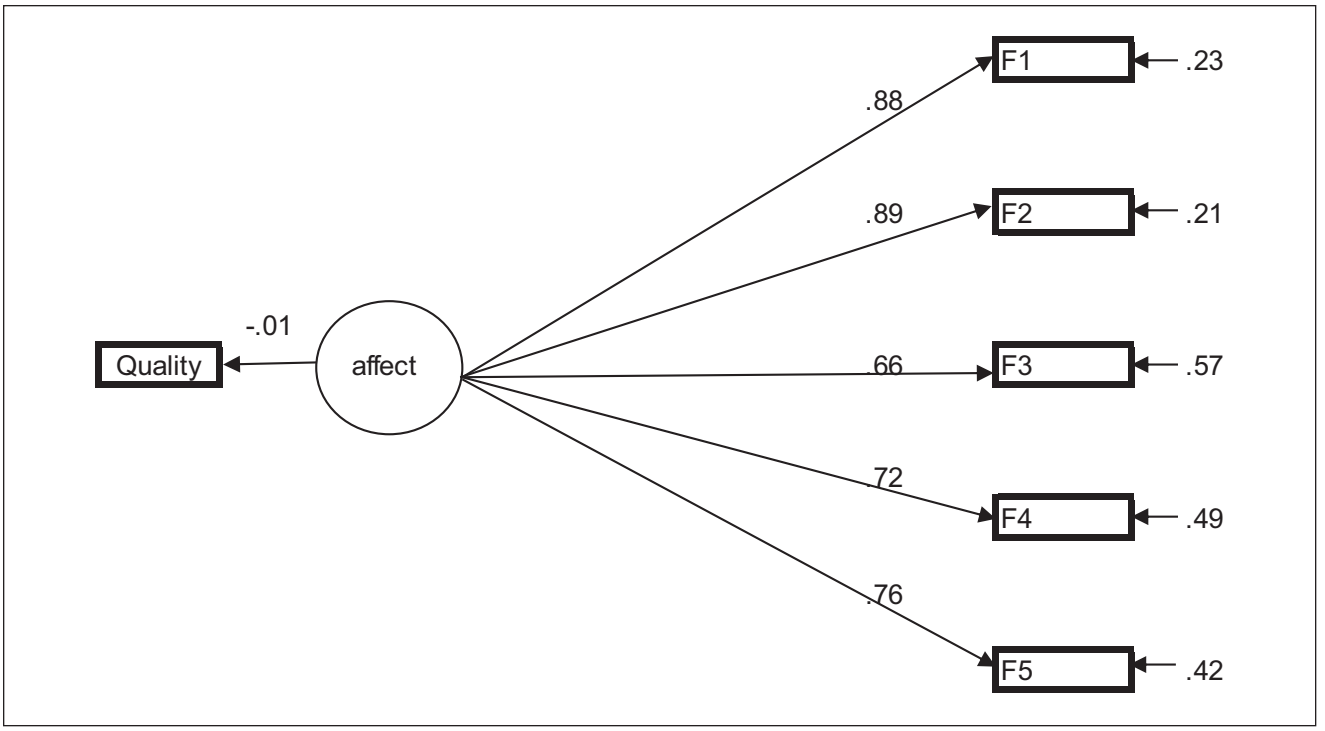

Figure 8. Standard error of measurement for the relationship between affect and writing quality.
Note. The loadings are standardized.

importance of substance (White & Bruning, 2005), we anticipated higher scores for FYC on these subscales. However, we anticipated that BW would score higher on subscales for constructs with negative relationships to writing performance, in particular, avoidance goals (Kauffman et al., 2010; MacArthur et al., 2016; Pajares & Cheong, 2003) and belief in the importance of mechanics (MacArthur et al., 2016; Shaughnessy, 1977). Our hypotheses were partially confirmed. The FYC students did score significantly higher on self-efficacy for strategies and grammar, though not for self-regulation. The BW group scored higher on belief in the importance of mechanics. However, no group differences were found for goal orientation or belief in the importance of substance.

The findings comparing the BW and FYC groups highlight substantive concerns about the motivation of BWs. The result about beliefs in mechanics demonstrates the limitations that BWs have in their conceptual understanding about "what matters" in writing as they value correctness in conventions and grammatical accuracy (Shaughnessy, 1977). A similar challenge is common for learners with LD, who overemphasize conventions and corrections on spelling and grammar (Graham et al., 1993). The findings about avoidance goals and self-efficacy highlight the instructional challenge of enhancing the confidence of low-achieving writers to help them develop more positive goals that support engagement.

Regarding patterns of responses of groups, females overall had higher mastery-goal orientation compared with males and higher beliefs about the importance of substance in writing. These findings confirm previous research on female students' motivation to be better writers (Pajares, 2003). It should be noted, however, that there were no differences in self-efficacy or affect between males and females as might have been expected (Bandura, 1982). The study also showed that male students tended to place more value on beliefs about the importance of mechanics and grammatical correctness compared with females.

Our study also investigated relationships between the motivation constructs and writing quality. Regarding goal orientation, although the group comparisons did not find significant differences, the SEM analysis found that avoidance goals were negatively related to writing quality. The prior study by MacArthur et al. (2016) found a negative correlation between writing quality and avoidance goals. We did not find the anticipated positive relationship with mastery goals. For self-efficacy, the SEM analysis confirmed expectations with all subscales positively related to writing quality, a finding that further demonstrates the role of self-efficacy beliefs in writing performance. The prior study (MacArthur et al., 2016) had not found such relationships, perhaps, because it included only BW classes. In this study with a more diverse and expanded sample, we were able to demonstrate the positive relationships of self-efficacy for

strategy use, self-regulation, and grammar with writing quality. The two subscales about beliefs were related to writing quality as anticipated: Belief in the importance of conventions was negatively related to writing quality, whereas belief in the importance of substance was positively related. These results are consistent with the prior study (MacArthur et al., 2016).

Study Limitations and Future Research

One limitation is that the study gathered data only at the beginning of a semester course. Thus, we were not able to detect changes in motivation due to instruction and to examine the scales' ability to detect change across time or to examine what types of instruction resulted in motivational changes. The prior study (MacArthur et al., 2016) was conducted as part of a design research study and had data from before and after instruction; it found effects in the anticipated direction. An experimental study with BWs (MacArthur et al., 2015) found increases in self-efficacy and mastery goals as a result of an intervention based on strategy instruction with self-regulation. Future research could examine how instruction affects motivational constructs across time for different groups of students and how instructional interventions interact with those.

Another limitation is the alpha coefficient of .66 for beliefs on mechanics. Although the alpha is close to .70 and considered adequate, and the relationship of the subscale was as expected with writing quality and goal orientation subscales, the results nonetheless should be interpreted with caution. It should be noted that the low alpha may be due to the fewer items within the subscale (Cortina, 1993) and does not necessarily indicate lack of reliability. Future research could consider revisions on that subscale.

The purpose of the current study was to validate the four scales in the questionnaire. However, future research should also consider interactions among motivational constructs to test theories of motivation and relationships with writing performance. The correlations among the subscales (see Tables 7 and 8) show both positive and negative relationships, which could be explored further.

Implications

Motivation is a challenging construct for learners and multidimensional; thus, it is complex to measure. The current study extends the work by MacArthur et al. (2016) to include BW and FYC students and validate an instrument that includes the constructs of goals, self-efficacy, beliefs, and affect. It expands research on motivation beyond self-efficacy, which has received the most attention in motivational research (Bruning & Kauffman, 2016; Perin, 2020). The study examined patterns of responses among higher- and lower-achieving college writers to examine the sensitivity of the instrument to detect such differences. Finally, the study examined the relationship of those constructs with writing quality, further showing the instrument's validity and reliability. This questionnaire can be used by FYC and BW instructors to assess multiple aspects of their students' motivation. It could be administered prior to instruction to better understand students' predispositions, beliefs about the importance of writing substance and mechanics, goals, and self-efficacy; it could be repeated at the end of a semester to examine changes in students' perspectives and motivation. It could also be used in research to examine outcomes of instruction (e.g., MacArthur et al., 2015). These applications of the questionnaire may be especially useful for adult learners who may have LD (identified or not) and in BW classes, which may include many LD learners (Patterson, 2020).

Declaration of Conflicting Interests

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Supplemental Material

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References

American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (2014). *Standards for educational and psychological testing*. American Educational Research Association.

Bahr, P. (2011). Deconstructing remediation in community colleges: Exploring associations between course-taking patterns, course outcomes, and attrition from the remedial math and remedial writing sequences. *Research in Higher Education*, *53*(6), 661–693. https://doi.org/10.1007/s11162-011-9243-2

Bailey, T., Jeong, D., & Cho, S. (2010). Referral, enrollment, and completion in developmental education sequences in community colleges. *Economics of Education Review*, *29*(2), 255–270. https://doi.org/10.1016/j.econedurev.2009.09.002

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, *37*(2), 122–147. https://doi.org/10.1037//0003-066x.37.2.122

Bandura, A. (2006). Guide for constructing self-efficacy scales. In F. Pajares & T. C. Urdan (Eds.), *Self-efficacy beliefs of adolescents* (pp. 307–337). Information Age.

Banks, J. (2014). Barriers and supports to postsecondary transition: Case studies of African American students with disabilities. *Remedial and Special Education*, *35*(1), 28–39. https://doi.org/10.1177/0741932513512209

Bereiter, C., & Scardamalia, M. (1987). *The psychology of written composition*. Lawrence Erlbaum.

Bipp, T., Steinmayr, R., & Spinath, B. (2008). Personality and achievement motivation: Relationship among Big Five domain and facet scales, achievement goals, and intelligence. *Personality and Individual Differences*, *44*, 1454–1464. https://doi.org/10.1016/j.paid.2008.01.001

Brown, G. L., Glasswell, K., & Harland, D. (2004). Accuracy in the scoring of writing: Studies of reliability and validity using a New Zealand writing assessment system. *Assessing Writing*, *9*(2), 105–121. https://doi.org/10.1016/j.asw.2004.07.001

Brownell, S., Price, J., & Steinman, L. (2013). Science communication to the general public: Why we need to teach undergraduate and graduate students this skill as part of their formal scientific training. *Journal of Undergraduate Neuroscience Education* , *12*(1), E6–E10.

Bruning, R., Dempsey, M., Kauffman, D., Mckim, C., & Zumbrunn, S. (2013). Examining dimensions of self-efficacy for writing. *Journal of Educational Psychology*, *105*(1), 25–38. https://doi.org/10.1037/a0029692

Bruning, R. H., & Horn, C. (2000). Developing motivation to write. *Educational Psychologist*, *35*(1), 25–37. https://doi.org/10.1207/S15326985EP3501_4

Bruning, R. H., & Kauffman, D. F. (2016). Self-efficacy beliefs and motivation in writing development. In C. A. MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of writing research* (pp. 160–173). Guilford Press.

Chen, X. (2016). *Remedial course taking at U.S. public 2-year and 4-year institutions: Score, experience, and outcomes* (NCES 2016-405). U.S. Department of Education, National Center for Education Statistics. https://nces.ed.gov/pubs2016/2016405.pdf

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling*, *9*, 233–255. https://doi.org/10.1207/S15328007SEM0902_5

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum.

Cortiella, C., & Horowitz, S. H. (2014). *The state of learning disabilities: Facts, trends, and emerging issues*. National Center for Learning Disabilities.

Cortina, J. M. (1993). What is a coefficient alpha? An examination of theory and applications. *Journal of Applied Psychology*, *78*(1), 98–104.

Elliot, A. J. (2007). A conceptual history of the achievement goal construct. In A. J. Elliot & C. S. Dweck (Eds.), *Handbook of motivation and competence* (pp. 52–72). Guilford Press.

Elliot, A. J., & Church, M. A. (1997). A hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology*, *72*(1), 218–232. https://doi.org/10.1037/0022-3514.72.1.218

Fan, X., & Sivo, S. A. (2005). Sensitivity of fit indices to misspecified structural or measurement model components: Rationale of two-index strategy revisited. *Structural Equation Modeling*, *12*, 343–367. https://doi.org/10.1207/s15328007sem1203_1

Fields, R., & Parsad, B. (2012). *Tests and cut scores used for student placement in postsecondary education: Fall 2011*. National Assessment Governing Board.

Graham, S. (2018). A revised writer(s)-within-community model of writing. *Educational Psychologist*, *53*(4), 258–279. https://doi.org/10.1080/00461520.2018.1481406

Graham, S., Schwartz, S. S., & MacArthur, C. A. (1993). Knowledge of writing and the composing process, attitude towards writing, and self-efficacy for students with and without learning disabilities. *Journal of Learning Disabilities*, *26*, 237–249. https://doi.org/10.1177/002221949302600404

Grubb, W. N., Boner, E., Frankel, K., Parker, L., Patterson, D., Gabriner, R., & Wilson, S. (2011). *Basic skills instruction in community colleges: The dominance of remedial pedagogy* (Basic Skills Instruction in California Community Colleges No. 2). Policy Analysis for California Education.

Harris, K., Graham, S., & Mason, L. (2006). Improving the writing, knowledge, and motivation of struggling young writers: Effects of self-regulated strategy development with and without peer support. *American Educational Research Journal*, *43*(2), 295–340. http://www.jstor.org/stable/3699421

Hayes, J. R. (1996). A new framework for understanding cognition and affect in writing. In C. M. Levy & S. Ransdell (Eds.), *The science of writing* (pp. 1–27). Lawrence Erlbaum.

Hayes, J. R., & Flower, L. (1980). Identifying the organization of writing processes. In L. Gregg & E. R. Steinberg (Eds.), *Cognitive processes in writing* (pp. 3–30). Lawrence Erlbaum.

Hidi, S., & Boscolo, P. (2006). Motivation and writing. In C. A. MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of writing research* (pp. 144–157). Guilford Press.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Jones, P., & Gloeckner, G. (2004). First-year college performance: A study of home school graduates and traditional school graduates. *The Journal of College Admissions*, *183*, 17–20.

Kauffman, D. F., Zhao, R., Dempsey, M. S., Zeleny, M. G., Wang, S., & Bruning, R. H. (2010, May). *Achievement goals' impact on 11th grade students' affect, self-efficacy, and writing achievement* [Paper presentation]. The American Educational Research Association annual meeting, Denver, CO, United States. https://doi.org/10.3389/fpsyg.2017.01406

Kellogg, R. T. (1996). A model of working memory in writing. In C. M. Levy & S. Ransdell (Eds.), *The science of writing: Theories, methods, individual differences, and applications* (pp. 57–71). Lawrence Erlbaum.

Kline, P. (1999). *The handbook of psychological testing* (2nd ed.). Routledge.

MacArthur, C. A., & Graham, S. (2016). Writing research from a cognitive perspective. In C. A. MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of writing research* (2nd ed., pp. 24–40). Guilford Press.

MacArthur, C. A., & Philippakos, Z. A. (2013). Self-regulated strategy instruction in developmental writing: A design

research project. *Community College Review*, *41*(2), 176–195. https://doi.org/10.1177/0091552113484580

MacArthur, C. A., Philippakos, Z. A., & Graham, S. (2016). A multi-component measure of writing motivation with basic college writers. *Learning Disability Quarterly*, *39*(1), 31–43. https://doi.org/10.1177/0731948715583115

MacArthur, C. A., Philippakos, Z. A., & Ianetta, M. (2015). Self-regulated strategy instruction in college developmental writing. *Journal of Educational Psychology*, *107*(3), 855–867. https://doi.org/10.1037/edu0000011

MacCallum, R. C., Roznowski, M., & Necowitz, L. B. (1992). Model modifications in covariance structure analysis: The problem of capitalization on chance. *Psychological Bulletin*, *111*(3), 490–504. https://doi.org/10.1037/0033-2909.111.3.490

Marsh, H. W., Hau, K. T., & Wen, Z. (2004). In search of golden rules: Comment on hypothesis-testing approaches to setting cutoff values for fit indexes and dangers in overgeneralizing Hu and Bentler's (1999) findings. *Structural Equation Modeling*, *11*(3), 320–341. https://doi.org/10.1207/s15328007sem1103_2

McCarthy, P., Meier, S., & Rinderer, R. (1985). Self-efficacy and writing: A different view of self-evaluation. *College Composition & Communication*, *36*(4), 465–471. https://doi.org/10.2307/357865

McCutchen, D. (1986). Domain knowledge and linguistic knowledge in the development of writing ability. *Journal of Memory and Language*, *25*(1), 431–444. https://doi.org/10.1016/0749-596X(86)90036-7

Messick, S. (1995). Validity of psychological assessment: Validation of inferences from person's responses and performances as scientific inquiry into score meaning. *American Psychologist*, *50*(9), 741–749. https://doi.org/10.1037/0003-066X.50.9.741

Nastal, J. (2019). Beyond tradition: Writing placement, fairness, and success at a two-year college. *Journal of Writing Assessment*, *12*(1). http://www.journalofwritingassessment.org/article.php?article=136

National Center for Educational Statistics. (2016). *Program for the International Assessment of Adult Competencies (PIAAC) 2012/2014: U.S. national supplement public use data files-household*. U.S. Department of Education.

National Governors Association Center for Best Practices, Council of Chief State School Officers. (2010). *Common Core state standards*.

National Research Council. (2012). *Improving adult literacy: Options for practice and research*. National Academy of Sciences.

Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research*, *66*(4), 543–578. https://doi.org/10.3102/00346543066004543

Pajares, F. (2003). Self-efficacy beliefs, motivation, and achievement in writing: A review of the literature. *Reading & Writing Quarterly*, *19*(2), 139–158. https://doi.org/10.1080/10573560308222

Pajares, F., & Cheong, Y. (2003). Achievement goal orientations in writing: A developmental perspective. *International Journal of Educational Research*, *39*(4–5), 437–455. https://doi.org/10.1016/j.ijer.2004.06.008

Pajares, F., Johnson, M. J., & Usher, E. L. (2007). Sources of writing self-efficacy beliefs of elementary, middle, and high school students. *Research in the Teaching of English*, *42*(1), 104–120. http://www.jstor.org/stable/40171749

Pajares, F., & Valiante, G. (2001). Gender differences in writing motivation and achievement of middle school students: A function of gender orientation? *Contemporary Educational Psychology*, *26*(3), 366–381. https://doi.org/10.1006/ceps.2000.1069

Pajares, F., & Valiante, G. (2006). Self-efficacy beliefs and motivation in writing development. In C. A. MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of writing research* (pp. 160–173). Guilford Press.

Patterson, M. B. (2020). Adults with low skills and learning disabilities. In D. Perin (Ed.), *Wiley handbook of adult literacy* (pp. 337–360). John Wiley.

Perin, D. (2020). Reading, writing, and self-efficacy of low-skilled postsecondary students. In D. Perin (Ed.), *Wiley handbook of adult literacy* (pp. 237–260). John Wiley.

Perin, D., & Charron, K. (2006). "Lights just click on every day": Academic preparedness and remediation in community colleges. In T. R. Bailey & V.S. Morest (Eds.), *Defending the community college equity agenda* (pp. 155–194). John Hopkins University Press.

Putnick, D. L., & Bornstein, M. H. (2016). Measurement invariance conventions and reporting: The state of the art and future directions for psychological research. *Developmental Review*, *41*(1), 71–90. https://doi.org/10.1016/j.dr.2016.06.004

Schunk, D. H. (1983). Goal difficulty and attainment information: Effects on children's achievement behaviors. *Human Learning: Journal of Practical Research & Applications*, *2*(2), 107–117.

Schunk, D. H. (1990). Goal setting and self-efficacy during self-regulated learning. *Educational Psychologist*, *25*(1), 71–86. https://doi.org/10.1207/s15326985ep2501_6

Shaughnessy, M. (1977). *Errors and expectations: A guide for teachers of basic writing*. Oxford University Press.

Shell, D., Murphy, C., & Bruning, R. (1989). Self-efficacy and outcome expectancy mechanisms in reading and writing achievement. *Journal of Educational Psychology*, *81*(1), 91–100. https://doi.org/10.1037/0022-0663.81.1.91

Snyder, T. D., de Brey, C., & Dillow, S. A. (2016). *Digest of education statistics 2014* (NCES 2016-006). U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics. https://nces.ed.gov/pubs2017/2017094.pdf

Traga Philippakos, Z. A. (2020). Developing strategic learners: Supporting self-efficacy through goal setting and reflection. *The Language and Literacy Spectrum*, *30*(1), 1–24.

Traga Philippakos, Z. A., & MacArthur, C. A. (2020). Writing strategy instruction for low-skilled postsecondary students. In D. Perin (Ed.), *Wiley handbook of adult literacy* (pp. 495–516). John Wiley.

Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance: Suggestions, practice, and recommendations for organizational research. *Organizational Research Methods*, *2*, 4–70. https://doi.org/10.1177/109442810031002

Vassiliou, J. (2011). Improved outcomes with computer-assisted instruction in mathematics and English language skills for Hispanic students in need of remedial education at Miami

Dade College, Florida. *Community College Journal of Research and Practice*, *35*(3), 191–201. https://doi.org/10.1080/10668926.2011.525195

White, M. J., & Bruning, R. (2005). Implicit writing beliefs and their relation to writing quality. *Contemporary Educational Psychology*, *30*(2), 166–189. https://doi.org/10.1016/j.cedpsych.2004.07.002

Wolfe, C. (2011). Argumentation across the curriculum. *Written Communication*, *28*(2), 193–219. https://doi.org/10.1177/0741088311399236

Zimmerman, B., & Bandura, A. (1994). Impact of self-regulatory influences on writing course attainment. *American Educational Research Journal*, *31*(4), 845–862. https://doi.org/10.3102/00028312031004845