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The Writing Attitude Scale for Teachers (WAST)

Anna H. Hall
Clemson University, ah2@clemson.edu

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Abstract

This study examines the psychometric properties of the Writing Attitude Scale for Teachers (WAST) using scores of preservice teachers to gather evidence of content, internal structure, response processes, reliability/precision, and correlations with external variables. Four contending models were compared using CFA, but the unidimensional model was championed. The WAST was further refined using IRT to 10-items and shown to have high precision across most of the latent continuum. The WAST was shown to have incremental evidence relative to the Writing Apprehension Test when predicting attitudes towards attending a professional development workshop on writing instruction and time devoted to writing instruction.

Keywords: attitudes, writing, teacher education, CFA, IRT, bifactor

School writing is located in interwoven activity systems that include writing produced by the teacher (e.g., assignments, written feedback, modeled writing), the students (e.g., drafts of papers, notes taken in class, journal entries), and outside sources (e.g., magazine articles, books, websites; Prior, 2006). Writing activity systems become nested as they work together and in time, they rely on each other to function optimally. As important links in these systems, teachers have the ability to strengthen or weaken students' understanding and enjoyment of writing as a social practice. Specifically, teachers' personal attitudes have been found to affect time spent on instruction, quality of instruction, and choice of teaching strategies (Bandura & Schunk, 1981; Robinson & Adkins, 2002; Street, 2003). Essentially, teachers' attitudes toward writing are a critical element in determining the quality of writing instruction (Cho, Kim, & Choi, 2003).

By the time preservice teachers enter teacher education programs, they have had years of personal writing experiences and have observed many examples of writing instruction. Over time, these experiences help shape their attitudes towards writing and greatly influence their orientation towards teaching writing (Norman & Spencer, 2005; Street, 2003). The instructional practices they choose to use in their future classrooms will vary depending on their personal experiences with writing, their teacher models, strategies they are introduced to during methods courses, and the enjoyment level they feel when they anticipate and practice teaching writing (Bandura, 1997; Tschannen-Moran & McMaster, 2009).

In order to help preservice teachers examine and reflect on their attitudes toward writing, it is critical for the field of writing to have a reliable and valid method in which to measure writing attitudes of teachers (Ng et al., 2010). Although current scales exist to measure the attitudes of teachers towards math, science, and statistics (Beswick, 2006; Libarkin & Anderson, 2005; Schau, 2003; White, Way, Perry, & Southwell, 2005), existing writing attitude scales (e.g.,

Daly & Miller, 1975; Emig & King, 1979; Knudson, 1993, McKenna, Kear, & Ellsworth, 1995) focus solely on writing apprehension (Bline, Lowe, Meixner, Nouri, & Pierce, 2001) or interest and value (Jenson, 1992), have limited items per domain or factor (Knudson, 1993), and are dated (Steve Graham, personal communication, October 30, 2010). As such, the current study was designed to develop a comprehensive and current scale measuring writing attitudes to assist preservice teachers in becoming more self-reflective in their teaching practices and to help teacher educators strengthen coursework in writing (Ng et al., 2010).

Background

One of the better supported measures of writing attitudes is a 26-item scale developed by Daly and Miller (1975), the Daly-Miller Writing Apprehension Test (WAT). The scale focuses on measuring writing apprehension and does not account for other attitudinal factors such as enjoyment and cognitive competence towards writing. Briefly, the WAT was developed using a sample of undergraduate students enrolled in basic composition courses and interpersonal communication courses to describe a form of writing anxiety and correlated with perceived likelihood of success in writing (Pajares & Valiente, 2006), but it was not specifically designed for measuring writing attitudes of preservice teachers. However, the WAT is routinely used for measuring writing attitude.

The Emig-King Attitude Scale for Teachers (AST; Emig & King, 1979) was designed specifically to measure the writing attitudes of preservice and inservice teachers. The AST contains 50 items that measure three subscales of writing attitudes (overall preference for writing, perception of self and others as writer(s), and the awareness of the process of writing including revision practices and topic choice), which focus primarily on teachers' interest level in writing and the value they place on writing. The AST does not measure other attitudinal

factors such as affect (e.g., like, enjoy, fun) and cognitive competence in writing (e.g., capable, knowledgeable, skilled; Tapia & Marsh, 2004).

The previously described scales are limited in accurately measuring writing attitudes due to construct under-representation. Construct under-representation occurs when "the [scale] is too narrow and fails to include important dimensions or facets of the construct" (Messick, 1989, p.34). Another limitation of previous writing attitude scales is that they have not provided or discussed evidence of consequential-related validity (Messick, 1989; AERA, APA, and NCME, 2014). Briefly, this concept refers to evidence and justification for evaluating the intended and unintended results of score interpretation and use (Brualdi, 1999).

Importantly, previously developed scales of writing attitudes of preservice teachers have been developed using classical test theory (CTT) or factor analytic models that treat items as having interval properties, although the items are inherently ordered categories. To date, no studies have used item response theory (IRT; Lord, 1952; Lord & Novick, 2008) to evaluate items and scales reflecting writing attitude despite studies highlighting the advantages of IRT vs. CTT in scale construction (see for e.g., Green, Yen, & Burket, 1989; Embretson & Reise, 2000).

The Present Study

The purpose of the current study was to build on the previous research of Daly and Miller (1975) and Emig and King (1979) by developing a comprehensive and efficient Writing Attitude Scale for Teachers (WAST) in order to assist preservice teachers in becoming more self-reflective in their teaching practices and to help teacher educators strengthen coursework in writing. The WAST quantifies the level of preservice teachers' writing attitudes using four facets based on a review of existing literature and writing attitude instruments.

Our study investigated the psychometric properties of WAST for assessing writing attitudes among preservice teachers. Specifically, we examined the factor structure and reliability of WAST. We also examined predictive relationships between scores on the WAST with the Writing Apprehension Test (WAT; Daly & Miller, 1975), amount of time teachers planned to spend on writing (including allowing students to write, allowing students to share, and teaching students how to write), and teachers' willingness or desire to attend a workshop on writing instruction. Teachers' attitudes toward a content area (such as writing) have been shown to explain time spent on instruction and quality of instruction, as well as the level of persistence and perseverance when obstacles arise (Jones, 2008; Pajares, 2003; Zumbrunn, 2010). Therefore, we expected preservice teachers with more positive attitudes toward writing to be more willing to attend a professional development workshop on writing instruction and plan on devoting more time to writing instruction.

Methods

Participants

The participants were preservice teachers from two large public land grant universities in the Southeast. Participating sites were selected by choosing colleges of education that had preservice teacher demographics representative of the general region in the two states. The sample consisted of 591 preservice teachers who received a questionnaire distributed via SurveyMonkey (response rate was 24%). Table 1 summarizes participant characteristics.

<INSERT TABLE 1>

Measures

WAST. The current study examined preservice teachers' writing attitudes on a newly developed instrument. The WAST is defined by the following four facets: (a) Enjoyment in

writing – The pleasure teachers have towards writing (e.g., like, enjoy, fun, enthusiastic), (b) Interest towards writing - the level of individual interest teachers have towards writing (e.g., interesting, fascinating, amusing); (c) Value and Utility of writing – The value teachers place towards writing in their personal and future professional life (e.g., worth, necessary, useful, applicable, relevant); and (d) Cognitive Competence in writing – The teachers' views about their intellectual knowledge and skills when applied to writing (e.g., able, capable, knowledgeable, competent).

The facets used to define writing attitudes were informed by the revised SATS-36 (Schau, Stevens, Daulphinee, & Del Vecchio, 1995; Schau, 2003) and previously developed writing attitude scales. The SATS-36 measures attitudes towards statistics using six subscales (i.e., affect, interest, value, difficulty, cognitive competence, and effort; Schau, 2003). Initially, a pool of 36 items (5-8 items per subscale) were written and developed by the authors on the basis of the definition of each facet outlined above and in accordance with a review of the literature on writing attitudes and scales in current use. In order to provide test content evidence on the WAST, seven full-time graduate students were asked to provide feedback on the items for clarity, redundancy, and ambiguity. After initial feedback from the graduate students, a second review of WAST items was conducted by three experts in the field of writing to provide additional test content evidence and consequential-related evidence of validity. Experts also provided qualitative feedback about item clarity, appropriateness of facet descriptions, suggested modifications to items, and positive and negative consequences for future testing.

None of the experts indicated any bias in item phrasing. Based on feedback from experts and to reduce the cognitive burden on respondents (Miller, 1956), we kept the response scale balanced - without a middle response category – and with four response category options.

Preservice teachers indicated their level of agreement with each attitudinal statement using a 4-point bipolar Likert-type response scale system ranging from 1 (*Strongly Agree*) to 4 (*Strongly Disagree*). Item responses were recoded so higher ratings on WAST items reflected a more positive attitude towards writing. A copy of the 37-itemWAST is provided in the Appendix.

WAT. The WAT (Daly & Miller, 1975) is a 26-item scale designed to measure writing apprehension. Participants indicated their level of agreement with each statement using a 4-point bipolar Likert-type response scale system. Prior to data analysis, item responses were recoded so higher ratings on WAT items reflected a higher level of agreement towards writing (lower writing apprehension or increased writing attitude) and a lower score reflects a lower level of agreement towards writing (increased writing apprehension or increased writing anxiety) (ω = .95, bootstrap bias corrected [BC] 95% CI [94., .96]).

Criterion Measures

Professional development workshop attitude scale. Preservice teachers' general attitude toward a professional development session on writing instruction was assessed by six items. Respondents indicated their level of agreement towards each statement using a 4-point Likert-type response scale ranging from 1 (*Strongly Disagree*) to 4 (*Strongly Agree)* (ω = .87, BC 95% [.83, .89]). A sample item included "I would enjoy such a workshop". A copy of the workshop scale can be requested from the first author.

Time devoted to writing instruction. The amount of time preservice teachers expected to devote to writing instruction was measured using three items. Items included "Allowing your students to write (including time spent planning, drafting, revising, and editing text)", "Allowing your students to share their writing with others (including peers, teachers, and visitors)", and "Teaching your students about how to write (how to plan, draft, revise, and edit text)."

Procedure

Data was collected by establishing testing sites with the Associate Dean from the college of education at two selected southeastern universities. The Associate Deans each distributed an e-mail cover letter approved by the institutional review board to all preservice teachers at their institutions for a 5-week period during the fall term at each site. The e-mail cover letter gave participants background information about the study and invited them to follow a link to SurveyMonkey to complete a survey. Respondents completed a survey consisting of the WAST, WAT, demographic questions, time devoted to writing instruction questions, and a professional development workshop attitude scale. The survey took participants about 10-20 minutes to complete. The professional development workshop attitude scale and time devoted to writing instruction questions were administered to about half the participants at site 1 and all at site 2.

Data Analytical Approach

Analyses were conducted to address the research purposes in the following steps. First, confirmatory factor analysis (CFA) was conducted to examine whether the proposed four-factor structure of WAST was appropriate for the present sample. Second, IRT analyses were employed to provide item-level fit statistics and item parameter estimates and offer additional information about particular items that might be responsible for an overall poor model fit. Finally, a series of correlation and hierarchical multiple regression analyses were conducted to examine the relationship between the WAST with the WAT (Daly & Miller, 1975), amount of time teachers planned to spend on writing, and teachers' willingness or desire to attend a workshop on writing instruction.

Results

Evidence of Factor Structure

Four competing confirmatory factor analysis (CFA) models were estimated and compared using weighted least squares with mean and variance correction (WLSMV) as implemented in M*plus* 7.11 (Muthén & Muthén, 1998-2013: unidimensional model, four-factor (correlated-factors model), second-order model, and bifactor model (see Figure 1).

<INSERT FIGURE 1>

These four models were considered as each could be a valid representation of our data and fitting these four models is commonly recommended when examining the internal structure of an instrument (see Reise, Moore, & Haviland, 2010) that may potentially be multidimensional. The bifactor model is important as it allows us to consider if indeed the data are multidimensional or if a unidimensional solution best represents the data (Reise et al., 2010).

Table 2 shows the standardized parameter estimates, and when appropriate estimated latent factor intercorrelations, based on fitting each of the four CFA models to the data. The unidimensional solution did not have adequate fit, $\chi^2(629) = 6{,}068.908$, $p < .001$, RMSEA = .121, 90% CI [.118, .124], CFI = .877, TLI = .870, and WRMR = 3.218. However, the four-factor model had acceptable fit, $\chi^2(623) = 3{,}373.803$, $p < .001$, RMSEA = .086, 90% CI [.084, .089], CFI = .938, TLI = .934, and WRMR = 2.119. A Chi-square difference test showed the four-factor model had improved fit to the data over the unidimensional solution, $\chi^2_{DIFF}(6) = 719.089$, $p < .001$. Interestingly, the estimated latent factor intercorrelations among the four factors were high, ranging from .66 (Interest and Cognitive Competence) to .88 (Enjoy and Interest).

Next, a 2nd-order factor model was fit to the data and shown to have acceptable and almost identical fit to the four-factor solution, $\chi^2(625) = 3{,}375.598$, $p < .001$, RMSEA = .086, 90% CI [.083, .089], CFI = .938, TLI = .934, and WRMR = 2.145. A review of the 2nd-order factor solution pattern loadings showed all four were highly related (> .75) to the second-order trait of attitude towards writing.

The final model considered was a bifactor model, which was shown to have acceptable fit to the data, $\chi^2(592) = 2805.540$, $p < .001$, RMSEA = .08, 90% CI [.077, .083], CFI = .95, TLI = .94, and WRMR = 1.77. Furthermore, the bifactor solution had improved fit compared to the 2nd-order solution, $\chi^2_{DIFF}(33) = 565.870$, $p < .001$.

Importantly, Table 2 shows the general factor pattern loadings for the bifactor solution are generally substantively larger than the corresponding group-specific pattern loadings and that the general factor pattern loadings are approximately similar in magnitude with the unidimensional pattern loadings. Also, all of the factor correlations in the 4-factor solution (bottom of Table 2) are large in magnitude (> .65) and all 2nd-order loadings in the 2nd-order solution are large (> .75). Following the suggestions provided in Reise et al. (2010), these CFA results suggest a unidimensional model best represents the WAST. Next, we fit this solution within the IRT framework to identify and remove poor fitting items and those items that were redundant in phrasing with other items.

<INSERT TABLE 2>

IRT Analyses

The graded response (GR, Samejima, 1969) and generalized partial credit (GPC) models were used to calibrate the 37-item WAST. IRTPRO version 2.1 program (Cai, du Toit, &

Thissen, 2011a) was used to estimate item parameters using the Bock-Aitkin EM (BAEM, Bock & Aitkin, 1981) algorithm.

Evidence of Response Processes

To provide evidence based on response processes or ordering of response categories we inspected the GR and GPC models option response functions plot for each item on the WAST. A review of all items ORFs plots showed no evidence of disorder, lending support that respondents are generally using the agreement categories as expected (higher responses reflect writing attitude).

Local Independence Assessment

Local independence was assessed by examining the standardized local dependency (LD) χ^2 statistic (Chen & Thissen, 1997). Items were considered to have possible LD if the absolute value of the standardized LD χ^2 statistic was greater than 10 (Cai, du Toit, & Thissen, 2011b; p. 77). The approach we used for detecting item pairs with suspected LD was similar to that described in Edelen and Reeve (2007) and Author 2 (2014). After flagging pairs of items with suspected LD and a series of sensitivity analyses (not reported), the assumption of local independence was deemed tenable for the set of WAST items for both IRT models.

IRT Model Data Fit Assessment

Orlando and Thissen's (2000, 2003) S-χ^2 item-fit statistic for polytomous data and item-fit plots estimated in MODFIT version 3.0 (Stark, 2008) were used to assess fit at the item level. The Bayesian information criterion (BIC) and Akaike's information criterion (AIC) were both used to compare the relative fit of each IRT model. The model with the smallest AIC and BIC values was determined to have the best relative fit.

For the GPC model, 5 of the 37 items were identified as missfitting at the 5% nominal alpha level after accounting for the false discovery rates via the Benjamini and Hochberg (1995) adjustment, while 7 of the 37 items from the GR model were identified as missfitting with the same method (not reported). Item-fit plots corroborated these findings. Relative tests of fit showed the best fitting IRT model was the GPC model (BIC = 37,161.76, AIC = 36,513.25) vs. the GR model (BIC = 37,355.82, AIC = 36,707.31). Based on item level fit statistics and the global tests of relative fit, the GPC model was adopted as the more appropriate model for the WAST item set.

Finally, the WAST was further refined by removing items with inflated slopes ($a > 3$), weak slopes (a < .8), poor fit, and/or redundant in phrasing with other items. Items were removed all the while assuring items covered the four aspects of the WAST and representing varying locations across the latent continuum. To this end, an efficient 10-item WAST was retained and results are presented in Table 3.

<INSERT TABLE 3>

Evidence of Reliability and Precision

Using the 10-item WAST individual response pattern scores were obtained using the expected a posteriori (EAP) estimator (e.g., similar to z scores) and the metric was identified by setting the population mean to 0 and standard deviation to 1. A marginal reliability value of .89 was maintained throughout the score range of about -1.7 to 1.1, which covers most of the expected score range.

Correlational Evidence

Table 4 shows the Pearson correlations ® for EAP scores from the 10-item WAST with scores on the WAT, professional development workshop attitude scale, and estimated time

devoted to writing instruction. As expected, the correlation for EAP scores on the 10-item WAST had a strong positive relationship with scores on the WAT, $r = .79$. In general, all of the external variables correlations with the 10-item WAST were descriptively larger than with the 26-item WAT.

<INSERT TABLE 4>

Incremental Evidence

A series of hierarchical multiple regression analyses were conducted to examine the incremental prediction of WAST relative to the WAT when predicting scores on the professional development workshop attitude scale and time devoted to writing instruction. We also report the partial correlations for each of the predictors to gauge the relative incremental prediction for both predictors in the model. The results for each of these regression analyses are presented in Table 5. When adding WAST as a predictor the multiple R^2 significantly improved 3% - 9% for three of the four criterions: professional development workshop attitude scores, allowing students time to write class time, and allowing students to share writing. Moreover, an inspection of the partial correlations show that, in general, the partial for WAST was larger than the partial for WAT for each of the outcomes.

<INSERT TABLE 5>

Discussion

Encouraging preservice teachers to reflect on their attitudes toward writing is critical because beliefs and attitudes can have a strong influence on future teacher performance and student outcomes (Robinson & Adkins, 2002). According to constructivist theory, preservice teachers' attitudes and beliefs are well-established by the time they enter college (Cross, 2009; Ng et al., 2010), yet promising research has been conducted that suggests attitudes are still

evolving and that it is possible to help teachers develop into "self-regulated, critically reflective professionals" (Ng et al., 2010, p. 278) even after many years of experiencing negative attitudes toward writing.

Most teacher certification programs spend the majority of their time focusing on reading instruction and ignoring the importance of preparing teachers to provide writing instruction (Norman & Spencer, 2005); therefore, college writing experiences (i.e., those observed and experienced during teacher education methods courses) are instrumental in shaping beliefs and attitudes towards writing, and often help determine preservice teachers' orientations toward teaching writing (Norman & Spencer, 2005; Street, 2003). In this study, we examined several psychometric properties of a newly developed measure, Writing Attitude Scale for Teachers (WAST). Results deliver evidence of validity and reliability for the WAST indicating that the WAST does measure the constructs it claims to assess, the preservice teachers' writing attitude. It is important to note that IRT analyses suggest the item reduction and indicate limiting 37-item WAST to the 10 items. This short-version of WAST has the acceptable reliability and is significantly related to other teacher measures. Specifically, teachers with more positive writing attitudes are likely to spend larger amounts of time on writing instruction, choose more innovative teaching methods, and continually strive to improve instruction (Bandura & Schunk, 1981; Street, 2003).

In this study, we have presented a tool for documenting teachers' writing attitude that is appropriate for the preservice teachers and psychometrically sound. Having a reliable and comprehensive scale for measuring writing attitudes provides a useful tool for preservice teachers to self-reflect, as well as provides critical information for teacher educators to help strengthen coursework and inform instruction.

Limited research exists on the measurement of preservice teachers' attitudes towards writing; therefore, this study relied heavily on motivational research in the field of writing and attitude scales designed for college students and from other disciplines (e.g. statistics) to guide construct development. A second limitation was the overall low response rate (24%) of participants. Given this response rate, our ability to generalize the results to preservice teachers at a large southeastern university college of education is limited.

In addition, this study did not include cognitive interviews as an additional method to assess response processes more deeply as recommended by best practices in measurement (AERA et al., 2014; Cizek, Bowen, & Church, 2010). Future research should conduct cognitive interviews with participants. This would then allow researchers to examine the WAST items and instructions for unintended processes and/or items that failed to elicit the intended processes.

Finally, the WAST was only tested using a sample of preservice teachers. Future research would benefit from testing the WAST with inservice teachers to assist in examining how teachers' own attitudes towards writing affect their current instructional choices and the writing outcomes of their students.

Conclusion

This study aimed to develop a comprehensive and efficient instrument to measure the writing attitudes of preservice teachers. The findings indicate that a potentially useful and efficient (short) tool for preservice teachers, teacher educators, and researchers was developed. It is our hope that others will use the WAST as a tool for teacher self-reflection, but not for evaluation.

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Appendix

Thinking about your attitudes towards writing, indicate the extent to which you agree with the following statements. (Items are provided by content area for convenience but were randomized during the online survey. Respondents could choose from the following response options: Strongly Agree, Agree, Disagree, Strongly Disagree; options were provided in a Likert matrix consisting of radio buttons to the right of each item with column headings consisting of agreement ratings.) Items in bold represent final 10-item WAST.

1	**I write for personal enjoyment.**
4	Writing is fun.
13	**I like to share my written work with others.**
25	I find writing relaxing.
31	I am calm when I write.
32	I am enthusiastic about my writing.
35	Writing excites me.
37	I like writing.
3	**I am interested in understanding different writing techniques.**
5	I am interested in learning about writing.
7	**I am interested in using writing in my profession.**
8	I am interested in developing my writing skills.
15	**I think about my writing when I am away from it.**
17	I am interested in writing.
9	Writing is applicable in my life outside of school.
10	**My writing skills make me more employable.**
11	Writing to express feelings is a worthwhile activity.
14	I use writing in my everyday life.
18	Writing skills are necessary to complete my everyday tasks.
20	Writing helps me develop my thoughts.
21	**Writing is important for me to express my feelings.**
28	**Writing is relevant in my life.**
2	I know my strengths as a writer.
6	**I find writing easy to accomplish.**
12	I am able to write without difficulty.
16	I know my weaknesses as a writer.
19	It is easy for me to finish a piece of writing.
22	I am a skilled writer.
23	My ideas flow smoothly when I write.
24	I am able to complete writing tasks without assistance.
26	It is easy for me to start a new piece of writing.
27	I think of myself as a good writer.
29	**It is easy to organize my ideas when I am writing.**
30	I am a competent writer.
33	Writing is effortless for me.
34	I can learn how to become a better writer.
36	I make few writing mistakes.

Table 1
Description of Preservice Teachers in Study

	Preservice Teachers in Study		
Characteristic	Site 1 (n = 503)	Site 2 (n = 88)	Total (N = 591)
Gender			
Male	86 (17.1%)	6 (6.8%)	92 (15.6%)
Female	396 (78.7%)	76 (86.4%)	472 (79.9%)
Missing	21 (4.2%)	6 (6.8%)	27 (4.6%)
Age (in years)			
M	21.81	21.60	21.78
Mdn	21.00	21.00	21.00
SD	4.93	4.67	4.88
Range	18-58	19-59	18-59
Missing	31	8	39
Ethnicity			
European American	429 (85.3%)	77 (87.5%)	506 (85.6%)
African American	28 (5.6%)	1 (1.1%)	29 (4.9%)
Hispanic	8 (1.6%)	2 (2.3%)	10 (1.7%)
Other	17 (3.4%)	2 (2.3%)	19 (3.2%)
Missing	21 (4.2%)	6 (6.8%)	27 (4.6%)

Note. Blanks indicate data was not available or not collected.

Table 2

Unidimensional(Uni), Four-Factor (4-factor), Second-Order (2nd-order), and Bifactor Solutions of the 37-item WAST

		4-factor				2nd-order				Bifactor				
Item	λ_{Uni}	λ_{F1}	λ_{F2}	λ_{F3}	λ_{F4}	λ_{F1}	λ_{F2}	λ_{F3}	λ_{F4}	λ_{Gen}	λ_{F1}	λ_{F2}	λ_{F3}	λ_{F4}
1	.80	.82				.82				.79	.28			
4	.88	.90				.90				.86	.34			
13	.69	.74				.74				.75	-.13			
25	.85	.88				.88				.86	.19			
31	.77	.81				.81				.83	-.15			
32	.91	.94				.94				.89	.29			
35	.88	.91				.91				.86	.38			
37	.91	.94				.94				.90	.29			
3	.69		.77				.77			.64		.65		
5	.75		.82				.82			.72		.51		
7	.76		.84				.84			.78		.19		
8	.66		.74				.74			.62		.57		
15	.64		.72				.72			.67		.10		
17	.88		.97				.97			.90		.19		
9	.66			.74				.74		.64			.48	
10	.63			.71				.71		.64			.29	
11	.69			.78				.78		.72			.08	
14	.63			.70				.70		.60			.52	
18	.62			.70				.70		.59			.59	
20	.78			.88				.88		.82			.02	
21	.75			.84				.84		.78			.03	
28	.74			.84				.84		.74			.46	
2	.65				.71				.71	.57				.40
6	.83				.89				.89	.69				.57
12	.77				.82				.82	.60				.58
16	.29				.33				.33	.25				.23
19	.75				.81				.81	.59				.58
22	.89				.93				.93	.67				.66
23	.79				.85				.85	.67				.50
24	.68				.74				.74	.55				.52
26	.71				.77				.77	.65				.34
27	.87				.92				.92	.69				.62
29	.74				.81				.81	.64				.47
30	.79				.85				.85	.68				.49
33	.74				.80				.80	.63				.48
34	.59				.64				.64	.62				.01
36	.55				.60				.60	.42				.48
						2nd-order λs								
						.98	.89	.89	.78					

	Correlations among factors			
	F1	F2	F3	F4
F1	1			
F2	.88	1		
F3	.84	.82	1	
F4	.77	.66	.71	1

Note. λ = standardized factor loading; Gen = general or common factor; F1 = Enjoyment in writing; F2 = Interest in writing; F3 = Value & Utility of writing; F4 = Cognitive Competence in writing. Threshold values for the confirmatory factor solutions are not provided, but can be provided upon request from the second author.

Table 3
Unidimensional Generalized Partial Credit Response Model Parameter Estimates for the Final 10-item WAST

Item	*a*	*b*	d_1	d_2	d_3	$S\text{-}\chi^2(df)$	*p*
1	1.92 (.18)	0.04 (.12)	1.31 (.08)	0.02 (.06)	-1.34 (.08)	51.56 (39)	.0856
13	1.49 (.14)	0.10 (.12)	1.63 (.11)	-0.23 (.08)	-1.40 (.10)	67.96 (42)	.0068
3	1.40 (.14)	-0.85 (.15)	2.06 (.19)	-0.10 (.11)	-1.97 (.14)	51.32 (39)	.0892
7	2.03 (.21)	-0.62 (.11)	1.44 (.10)	-0.02 (.07)	-1.41 (.08)	47.61 (37)	.1134
15	1.33 (.14)	0.22 (.13)	1.71 (.12)	-0.19 (.09)	-1.52 (.12)	51.80 (43)	.1677
10	1.22 (.14)	-1.43 (.18)	1.69 (.26)	0.27 (.18)	-1.95 (.16)	47.85 (37)	.1087
21	2.73 (.20)	-0.50 (.11)	1.63 (.12)	-0.10 (.07)	-1.52 (.10)	49.05 (39)	.1296
28	1.56 (.20)	-1.10 (.16)	1.81 (.21)	0.31 (.16)	-2.12 (.15)	57.92 (36)	.0117
6	1.47 (.19)	-0.53 (.12)	1.79 (.14)	0.14 (.10)	-1.93 (.13)	37.83 (40)	.5693
29	1.39 (.19)	-0.65 (.13)	2.01 (.17)	0.20 (.12)	-2.21 (.16)	56.93 (41)	.0500

Note. *a* = item slope or discrimination parameter; b = item location parameter; d_1-*d3* = item step parameter; Values in ( ) represent SE for item parameter or degrees of freedom (df) for fit statistic. Marginal reliability of response pattern scores = .89.

Table 4
Pearson Correlations for the WAST with External Variables

Variable	WAT	WAST
WAT		.78 [.77, .83]*
Workshop	.34 [.23, .44]*	.45 [.37, .53]*
Allow write (% class time)	.17 [-.03, .33]	.27 [.08, .40]*
Allow share (% class time)	.18 [.02, .32]*	.22 [.05, .37]*
Teach write (% class time)	.24 [.09, .38]*	.30 [.17, .44]*

Note. WAST = 10-item Writing Attitude Scale for Teachers; WAT = 26-item Writing Apprehension Test based; Workshop = writing workshop attitude scale; Allow write = allowing your students to write; Allow share = allowing your students to share their writing with others; Teach write = teaching your students how to write. Values in [] are 95% bootstrap corrected confidence interval based on 1,000 bootstraps.
*95% CI is statistically significant.

Table 5
Incremental Prediction of Writing Workshop Scores and Time Devoted to Writing Instruction

	Step 1		Step 2				
Variable	β	R^2	β	Partial *r*	*R*	R^2	ΔR^2
Workshop		**.11**			**.45**	**.20**	**.09**
WAT	**.34**		-.04	-.03			
WAST			**.48**	**.32**			
Allow write (% class time)		**.03**			**.26**	**.07**	**.04**
WAT	**.17**		-.11	-.07			
WAST			**.34**	**.20**			
Allow share (% class time)		**.03**			**.22**	**.05**	.02
WAT	**.18**		.001	.001			
WAST			.22	.13			
Teach write (% class time)		**.06**			**.31**	**.09**	**.03**
WAT	**.24**		-.01	-.01			
WAST			**.32**	**.19**			

Note. WAT = writing apprehension test; WAST = writing attitude scale for teachers; Workshop = writing workshop attitude scale; Allow write = allowing your students to write; Allow share = allowing your students to share their writing with others; Teach write = teaching your students how to write. Bold numbers are statistically significant at $p < .05$.

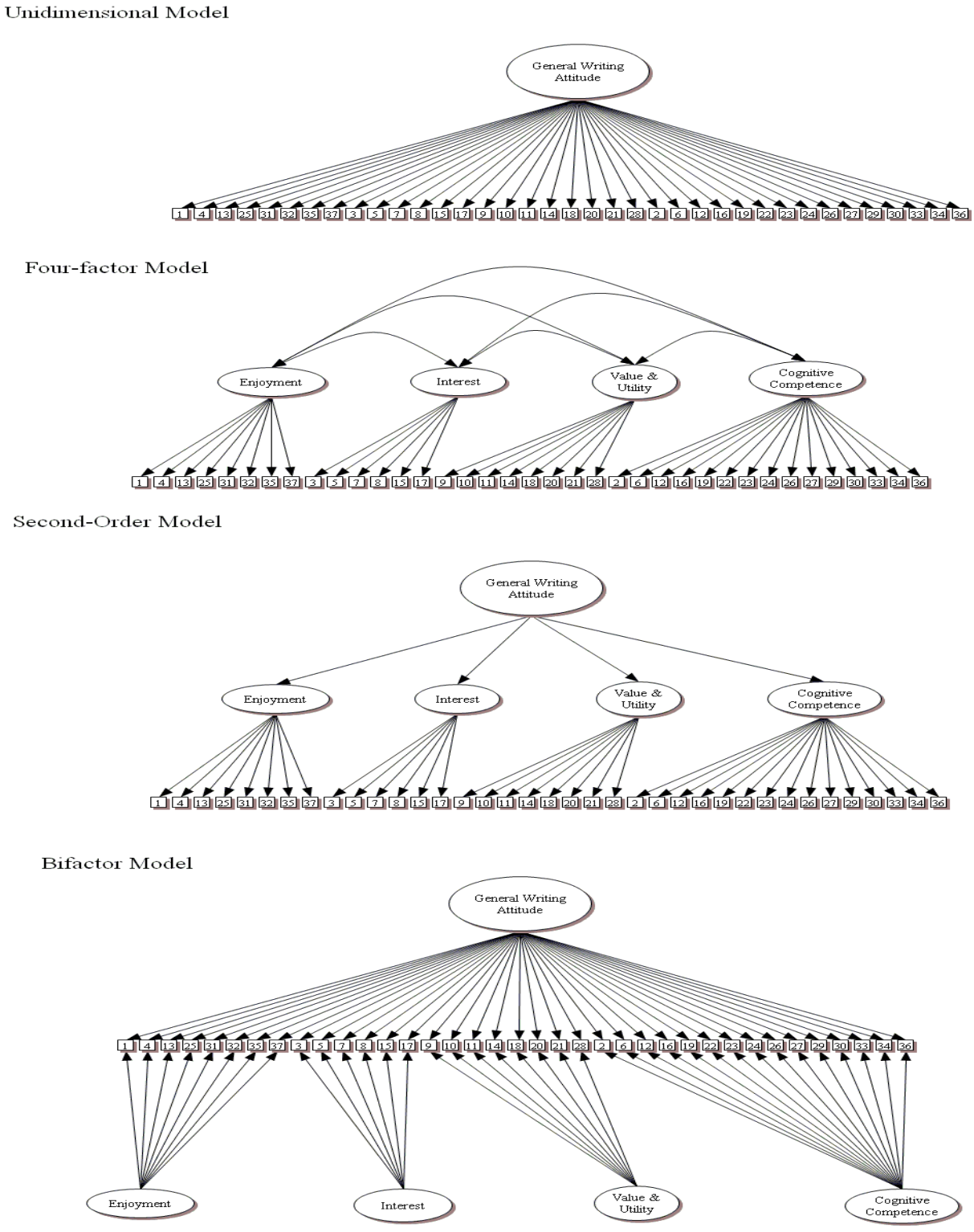

Figure 1. Depictions of the unidimensional, four-factor (correlated factors), second-order, and bifactor models. Boxes represent the observed item scores on the WAST. Residual variances for observed scores have been omitted for simplicity.