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Development of the Writing Attitudes and Strategies Self-Report Inventory

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DEVELOPMENT OF THE WRITING ATTITUDES AND STRATEGIES SELF-REPORT INVENTORY

by

Jennifer L. Weston

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Dedication

This thesis is dedicated to all of those who have stood by me and supported me throughout this process. Special thanks go to my fiancé Michael, my parents Jeffery and Lisa, and my best friend Tara. Without all of your love, support and understanding none of this would have been possible. I will forever be grateful to all of you.

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Abstract

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Several self-report inventories assess specific aspects of writing. However, skilled writing is a multidimensional process requiring a comprehensive measure that assesses writing attitudes, self-efficacy, and strategy use. The Writing Attitudes and Strategies Self-report Inventory (WASSI) is designed to fulfill this need. Currently in its second iteration, the WASSI-2 displays superior reliability and validity evidence when compared to other measures. The seven subscales all exceed minimum standards for Cronbach's alpha. Additionally, the underlying factor structure that best represents the data mirrors the intended seven-factor design. Validity evidence based on external relations was yielded from correlating the WASSI-2 scores with the Daly–Miller Writing Apprehension Test, the Children's Social Desirability Scale, and expert scores on student essays; all but one of the correlations were in the expected direction and of appropriate magnitude. This evidence indicates that the WASSI may potentially be a useful assessment tool for educators and researchers.

TABLE OF CONTENTS

LIST OF TABLES

Development of the Writing Attitudes and Strategies Self-Report Inventory

Introduction

Writing effectively is one of the most important skills that a student can learn in school. This idea is supported by the 2001 survey by Light wherein over 90% of professionals responded that writing was essential to their jobs. Nonetheless, most students leave high school without the necessary writing skills to be successful in higher education or the work place. The National Assessment of Educational Progress (NAEP) conducts periodic national testing to assess student proficiency across a variety of subjects including writing, reading, and mathematics. The results of the 2007 NAEP writing test suggest that only 25% of the nation's high school seniors are proficient writers. Of this 25%, only 1% of writers wrote well enough to be considered advanced in their writing ability. Even more troubling, 18% of students' writing skills are rated at below basic proficiency. Writing is pivotal to both current and future success for these students (Geiser & Studley, 2001; Kellogg & Raulerson, 2007; Powell, 2009). Steps need to be taken to provide these students with the necessary resources to enable them to learn to write effectively.

One way to increase proficiency in writing is by the teaching and use of strategies. Research has shown that the use of strategies aids the writer by lessening the demands on working memory and by activating prior knowledge (Ericsson & Kintsch, 1995; Kellogg, 2001; McNamara & Scott, 2001). Furthermore, strategies help students to enact the steps necessary to produce a successful written product. Writing strategies focus on the three different phases of writing (i.e., prewriting, drafting, and revision) and are taught and used both independently and in the context of a complete written product.

Writing strategies as discussed here can be defined as actions and behaviors that a writer consciously performs in an effort in improve their writing and to aid in their completion of the task (Petric & Czarl, 2003). Although writing strategies may be useful in isolation, it is the synergistic effect that is most beneficial. For example, teaching a student to brainstorm is useful and can aid in idea generation, but if the student does not know how to effectively incorporate those ideas into an essay by planning the essay, the exercise is less useful than when implemented in conjunction with planning. These synergistic effects, combined with the lack of time available in the classroom to teach writing (National Commission on Writing, 2003), render it important to identify gaps in student knowledge and use of writing strategies so that instruction can be properly targeted to meet their needs.

Components Important to Writing

There are many components that are important to the writing process. The components focused on by prior researchers include: brainstorming; planning; drafting of the introduction, body, and conclusion; revision; cohesion; attitudes toward writing; and self-efficacy for writing. These components seem to be most effective when used or taught in conjunction with one another because the strategies build upon each other. Although writing attitudes and self-efficacy cannot be taught, per se, they are essential to the writing process. Each of these components of the writing process and their importance to writing will be discussed below.

Prewriting. Prewriting activities are essential to success as a writer. Prewriting encompasses both idea generation (a.k.a., brainstorming) and idea organization (a.k.a., planning) for a piece of writing. Brainstorming and planning are both important activities

that can be completed independently of each other. Brainstorming and planning target different aspects of the writing process: the initial generation of ideas and the creation of a plan to develop those ideas. Brainstorming can be considered the process of initial idea generation, whereas planning is the process of idea organization (and sometimes adding to those ideas) and setting goals for an essay. For example, when given a topic for an essay on cell phones usage in cars, a student may brainstorm ideas about the dangers of using cell phones on the road. Once the process of planning has begun, the writer may realize that additional evidence and statistics about the dangers of cell phone use while driving are needed. It is during this stage of planning that many of the ideas are initially elaborated to include brief examples and evidence. In essence, the planning process not only provides the structure for how an essay will be constructed, it also indicates to the writer where knowledge gaps lie and where additional brainstorming may be necessary. Such prewriting skills have been the subject of numerous research studies, but most do not separate prewriting into brainstorming and planning. Regardless of which aspect of prewriting targeted by the research, overall it has demonstrated that many struggling writers lack prewriting skills (Cameron & Moshenko, 1996; Graham & Harris, 2000). Skilled writers, by contrast, spend a large amount of time on prewriting activities (Flower & Hayes, 1980; Graham & Perin, 2007; Kellogg, 1987).

Drafting. For our purposes, drafting concentrates on the actual writing of the essay and the necessary components: the introduction, body, and conclusion paragraphs. Although body paragraphs can be written in a variety of different ways depending on the type and scope of the writing, introduction and conclusion paragraphs are designed to fulfill certain requirements, for many of which strategies exist. The purpose of an

introduction is to “hook” your reader’s interest and compel them to read more. In addition, it is expected that an introduction will contain a thesis statement and some preview of the following text. Conclusion paragraphs are equally important; they summarize the details of the essay in a concise fashion and link the arguments back to the thesis statement. It may be difficult for novice writers to master writing introduction and conclusion paragraphs because of how they differ from other paragraphs. The principal differences are that introductions and conclusions have more defined goals and a larger number of necessary aspects (Henry & Roseberry, 1997). Well-written introduction and conclusion paragraphs are known to be important for a reader to understand and retain information they read (Lorch & Lorch, 1995). With the primary goal of writing being the communication of information, it is of prime importance that writers learn to effectively write introductions and conclusions.

Revision and cohesion. Revising is perhaps the most important stage of the writing process. The understanding that writing is an iterative process is of utmost importance to development as a writer. Traditionally, revision is considered to be completed after finishing a first draft of written work, although word processing softwares have rendered this process more continuous and online. Regardless of when revision occurs, revision is the process during which the writer reviews their writing with the intended goal of improving what they wrote (Hayes & Flower, 1980). In addition to improving text, another goal of revising is to ensure that what was written satisfies the goals or criteria of the assignment. Few writers, if any, produce flawless written works with the first draft; this being said, learning to use revision is of key importance for the development of competent writers.

Although cohesion is not necessarily a revision strategy, cohesion is generally assessed and fixed during the revision stage of writing. Cohesion refers to the aspects of the text that aid the reader in understanding and following the text (Graesser et al., 2004). Cohesion can be added to a text in a variety of ways, including but not limited to inserting connecting words or phrases, ensuring that all referents are defined, and by adding transitions between paragraphs. Cohesion is important for effective communication to the reader; thus, adding cohesion is to the benefit of the writer as well as the reader.

Attitudes. Researchers have long acknowledged that attitudes are related to abilities in a variety of ways. Research has show that writing attitudes are directly related to performance on a variety of writing measures, including standardized testing and classroom writing (Graham, Schwartz & MacArthur, 1993; Pajares, 2003). Although attitudes have been linked to writing success, little research has focused on the improvement of these attitudes. However, there is a large body of work that both assesses and describes student attitudes toward a wide variety of topics. Influencing a student's attitudes towards writing is not a simple task. Some researchers have attempted to influence these attitudes is by pointing out the benefits of writing to students and by attempting to make learning to write more fun. With student attitudes toward writing linked so closely with performance, it important that researchers understand not only how to assess these attitudes, but also how to change student attitudes toward writing.

Self-efficacy. Self-efficacy refers to an individual's view of one's own ability. A high level of self-efficacy for a task denotes that the bearer believes in their ability to succeed at that task. Self-efficacy, regardless of skill level, influences how students use

the strategies and skills they possess. Pajares (2003) reviews the expansive literature on self-efficacy and writing, noting that the research has consistently shown that self-efficacy is predictive of writing performance, regardless of the inclusion of other related measures. Assessment and improvement of student self-efficacy is important for developing writers. Fostering self-efficacy in writers should benefit the writers by influencing how they use writing strategies. Many researchers have tried to influence self-efficacy with limited success, though some promising work by Schunk and Swartz (1993) suggests that the combination of teaching students to use goals and giving them feedback can improve both self-efficacy and writing achievement. Considering the integral relationship between self-efficacy and achievement, it is understandable why self-efficacy is considered an important component of effective writing.

Related Research

Existing self-report writing inventories. High school students are of prime interest for this study, particularly considering the importance of writing skills in attaining future jobs and selection for higher education (Geiser & Studley, 2001; Kellogg & Raulerson, 2007; Light, 2001; Powell, 2009). It is important that students learn to write effectively and that actions are taken to fill any knowledge gaps they possess. In order to identify and remedy these knowledge gaps, an assessment instrument is needed that will allow educators to assess student writing strategy knowledge. There is a particular need for an assessment instrument that target high school students, both because there are none available and because students' writing continues to develop from high school into college (Crossley, McNamara, Weston, & Sullivan, in press). The multifaceted nature of writing necessitates a comprehensive, multidimensional measure to provide a

comprehensive picture of students' writing attitudes, self-efficacy, and strategy use that is appropriate for use in secondary education. Few self-report inventories that target writing strategy exist; however, most target early childhood or college/graduate school populations. Moreover, the following review of these instruments indicates that there are none available that comprehensively target high school students' writing attitudes, self-efficacy, and strategy use. The currently available writing scales also have not been extensively tested for reliability and validity with an appropriate number of participants or items. This section reviews currently available self-report inventories targeting various aspects of writing.

Writing strategy inventories. One of the few strategy assessments currently available was developed and reported by Torrance, Thomas, and Robinson (1994) who examined the writing strategies of 228 graduate students in the United Kingdom using a 35-item scale. The items on this assessment are purported to assess writing strategy use, the writing experience (similar to writing apprehension), productivity, and basic demographics. The strategy items focused solely on planning and revising strategies, whereas the writing experience items focused on problems encountered while writing. A cluster analysis of writing strategy items differentiated three groups of strategy users: *Planners*, *Revisers,* and *Mixed Strategy Users*. Torrance et al. found that students who belonged to the *Planners* group tended to be more productive than students within either of the other two groups. In addition, students classified as *Planners* reported having fewer difficulties while writing than did the *Mixed Strategy* group. These findings suggest that being a *Planner* is more beneficial than a *Reviser*. However, many of the writing experience questions were specific to the context of graduate school and the

participants included only graduate students. Thus, the results of this study may only generalize to this particular group of writers.

A later study by Torrance, Thomas, and Robinson (2000) focused on a population closer to our target population, undergraduate psychology students. This longitudinal study contained a more comprehensive measure of planning and revising strategies along with multiple assessments of student writing. Students in this study completed a 15-item writing strategy inventory along with a 6-item writing experience survey following each essay they completed. Although not discussed in detail, a principle components analysis was conducted and the 15-question survey yielded a four-factor solution. The four resulting factors were named *Development During Writing*, *Outlining*, *Multiple Drafting*, and *Exploration*. Notably, the questions that load on the factor called *Development During Writing* focused on essay planning (e.g., rather than processes during writing such as drafting). Reliability and validity are not specifically discussed for this measure and when the factor scores were regressed on essay grade, the only significant predictor in the equation was the exploration factor. The lack of relation between essay score and writing strategies in this measure is problematic because the use of writing strategies is theoretically expected to correlate with essay score. Through the use of cluster analysis of the items, Torrance et al. defined four patterns of writing strategy use, *Outline and Develop*, *Detailed Planning*, *Minimal Drafting*, and *Think Then Do*, with over 85% of students showing a preference for a particular strategy cluster across multiple writing assignments. They also noted stability in strategy preference across the three-year study. Although raw score relationships with essay score were minimal, they did find that those students who were in the groups *Detailed Planning* and *Think Then Do* scored

significantly higher on essays than those who fit into other strategy patterns. The grouping of students by strategy patterns suggests that most students do not rely on a single writing strategy but employ an identifiable pattern of writing strategies across different stages of writing.

The identification of a student's dominate strategy was also conducted via self-report inventory by Kieft, Rijlaarsdam, Galbraith, and van den Bergh (2007) wherein they used a writing strategy survey as the pretest for their study. Kieft et al. used items from the Writing Process Questionnaire (Janssen & Overmaat, 1990) to identify students' predominant strategy (i.e., planning or revising). This research assessed whether a student with a congruent strategy preference and class type performed better than those students' whose predominant strategy was incongruent with their class type. Cronbach's alpha was completed on the two scales with the results for the Planning scale approaching an appropriate level ($\alpha = .68$), and the Revising scale reaching an acceptable alpha level ($\alpha = .71$). Analyses of posttest scores showed that those who scored high on either planning or revising performed better when provided with class instruction about planning than did those who scored low on strategy use. In addition, they found no effect for the revising-based instruction for either strategy group. The authors postulate that this was due to the content of the Revising scale not sufficiently covering the manifestation of the construct of revising. Thus, although this scale was sufficiently reliable (i.e., demonstrating adequate alpha levels), the authors proposed that it lacked construct validity.

Writing attitude inventories. Researchers have long acknowledged that attitudes (often considered a subscale of motivation) influence abilities in a variety of ways. Graham, Berninger, and Fan (2007) examined the structural relationship between writing

attitudes and writing achievement in grade school students. They tested three different theory based models: writing achievement influencing writing attitudes, writing attitudes influencing writing achievement, and the reciprocal relationship between the two constructs. The model that best fit the data was the model in which writing attitudes influenced achievement. The direct comparison of competing models suggests that the model that converged mirrors the nature of the relationship in this population. Notably, however, this study included a highly constrained sample solely comprised of 1st and 3rd grade students from an affluent area. Hence, this research would need to be extended to other populations to understand the nature of this relationship across wider age ranges and populations.

Self-Efficacy inventories. Almost as important to writing success as strategy use are beliefs about ability to write. Regardless of the skills they possess, students' self-efficacy regarding their ability to write mediates what they do with those skills (Pajares & Johnson, 1996). Pajares (2003) reviews the expansive literature on self-efficacy and writing noting that the research has consistently shown that self-efficacy is predictive of writing performance, regardless of the inclusion of other related measures. Though there are many studies that show the importance of self-efficacy to writing, only two will be covered here, a study by Pajares and Johnson (1996), that focuses on our target population and provides an excellent summary of Pajares' previous work, and a recent study by Jones (2008).

A path analysis conducted by Pajares and Johnson (1996) explored the relationship between writing self-efficacy and performance. This study assessed students' writing performance, self-efficacy, apprehension, and aptitude. Students' writing was

assessed by means of a non-argumentative essay written in class and assessed by English professionals, and their writing aptitude was evaluated by their scores on state writing tests. The scales used to assess writing self-efficacy and apprehension were, the Writing Skills Self-Efficacy scale (Shell, Murphy, & Bruning, 1989) component skill subscale, and the Writing Apprehension Test (WAT; Daly & Miller, 1975). The path analysis showed that writing aptitude and self-efficacy had a significant effect on writing performance independently even though writing aptitude had a strong effect on writing self-efficacy. Writing self-efficacy had a strong negative effect on writing apprehension, and writing apprehension had a small negative effect on writing performance.

A study of 118 first semester freshman students (Jones, 2008) also provides evidence for the effect of self-efficacy on writing. In this semester long study of students' initial academic ability, achievement in the course, on a posttest essay, as well as self-efficacy and locus of control were assessed. Locus of control was found to be the most significant predictor of performance in this study. However, the measures chosen to assess locus of control and self-efficacy overlapped significantly, causing multicollinearity in the model. Though both measures correlated highly with the outcome variable, multicollinearity between the two measures caused self-efficacy (the slightly weaker predictor) to drop from the regression equation. This study highlights the difficulty faced by many researchers: that the assessment of self-efficacy independent of other constructs can be problematic due to multicollinearity with other measures.

Multi-faceted writing inventories. Two scales were located that encompass multiple aspects of the writing process (Graham, Schwartz, & MacArthur, 1993; Petric & Czarl, 2003). The first scale, developed by Graham, Schwartz, and MacArthur, assessed

elementary and middle school students' use of writing strategies, self-efficacy, and attitudes. The purpose of this inventory was to identify differences in strategy use, attitudes, and self-efficacy comparing students with learning disabilities to those without. All questions were read aloud, using Likert-scale questions to assess students' writing attitudes and self-efficacy, and open-ended questions to inquire about the students' knowledge and use of writing strategies, in particular what they do when they encounter problems while writing. The items in this open-ended (one-on-one) interview thus provide a starting point from which to create questions more applicable to our target age group and that can be answered on a Likert scale.

The second multi-faceted measure available was designed by Petric and Czarl (2003) to encompass the three stage nature of writing. It did so using strategy specific questions targeting second language learners. The 44 items were explicitly divided into the categories of *Planning Strategies*, *While Writing Strategies* (drafting), and *Revising Strategies*. The description of the measure developed by Petric and Czarl was unique because the authors provided explicit information about validity and reliability analyses conducted for the measure. Validity was assessed in this measure through expert evaluation of the items, and by assessing student understanding of items with a small pilot sample that used think aloud protocol while completing the inventory. This measure had a Cronbach's alpha value of .63, and the correlation between the original administration and the retest was .51. These values were below the acceptable range for the reliability of a measure (i.e., .70 or above for both Cronbach's alpha and test-retest correlations). Petric and Czarl offered several reasons for low reliability, including ambiguous questions, writing attitudes, and biases inferred by the wording of the

questions. A factor analysis was attempted, but the KMO measure of sampling adequacy was not within acceptable levels for the analyses to be interpreted. The authors made no attempt to revise their questionnaire, but did make suggestions about creating parallel items and reducing ambiguity in the questions. Although the population differs from our target population, this writing inventory provides benchmarks for validity and reliability of a writing strategy questionnaire.

A New self-report measure of writing. The Writing Attitudes and Strategies Self-Report Inventory (WASSI) was developed to meet the need for a multifaceted assessment of student writing at the high school level. The WASSI incorporates subscales to assess both self-efficacy and attitudes towards writing as well as writing strategies related to brainstorming, planning, writing introductions and conclusions, revising, ensuring cohesion, and paraphrasing. The simultaneous measurement of these factors in a single survey provides several benefits, including ease of data collection and interpretation. Although multiple assessment instruments could be used to assess the same information, there are problems that can arise from combining such instruments. For instance, different assessment instruments may include repetitious or redundant items, and the differences in how the items are written and framed may lead to response biases. Moreover, items may not all be answered using the same scale (e.g., Likert 1-5, Likert 1-100) or format (paper based or interview based). The WASSI will also extend our ability to assess and describe students' attitudes, self-efficacy, strategy use, and deficits therein. The comprehensive nature of the WASSI may also afford the opportunity to track changes in students' responses over time (e.g., before and after an intervention),

and potentially link patterns of responses across variables to particular writing deficits, which can be targeted for instruction.

The development of the WASSI has proceeded in two cycles. The initial cycle of development and data driven revisions have been completed with a second more comprehensive evaluation of the WASSI. This development and the revisions are described in the following sections.

The purpose of this study is to assess the reliability and validity of the WASSI-2 Total Score and subscales. The reliability will be established using both item-level statistics (Cronbach's alpha) and confirmatory factor analyses. The confirmatory factor analyses will be used to assess the underlying factor structure of the WASSI-2. After reliability based revisions are made to the WASSI-2, validity will be assessed. Validity will be assessed by examining the relation between the WASSI-2 and the Daly-Miller Writing Apprehension Test, the Children's Social Desirability Scale, and scores on student essays.

Method

Measures

Writing Attitudes and Strategies Self-Report Inventory. The WASSI used in this study was the second version of the WASSI. The development of the first version of the WASSI and the resulting empirically driven changes made from version one to version two are described in the following section.

Item choice, generation, and review. Item generation for the WASSI occurred in several stages. First, an initial set of items was adapted from existing questionnaire measures of writing attitudes and strategies (e.g., Graham et al., 1993; Jones, 2008; Kieft

et al., 2007; Torrance et al., 2000). Second, approximately 40 additional items were generated by researchers and professionals in the fields of assessment, strategies, and the teaching of English to target constructs not covered in previous measures. The new items related to specific strategies thought to be important to writing with the majority of new items pertaining to the drafting process. Although the Writing Skills Self-Efficacy scale (Shell et al., 1989) has been widely used, items for the WASSI were not derived from it due to focus of the measure being on the basic mechanics of writing.

The resulting items were reviewed by six experts familiar with the constructs of interest and by four high school and college instructors. Based on their feedback, the initial WASSI (see Appendix A) comprised 108 items encompassing eight intended subscales: Self-Efficacy (18 items), Attitudes (14 items), Brainstorming (8 items), Planning (14 items), Writing Introductions and Conclusions (8 items), Revision (22 items), Cohesion (16 items), and Paraphrasing (8 items). An equal number of positively and negatively worded items were generated for each subscale. All items were designed to be responded to on a 6-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (6). A 6-point scale was chosen to prevent participants from selecting the midpoint. By eliminating a midpoint the scale forces participants to decide if they agree or disagree with the statement.

WASSI-1 reliability and validity. The reliability and validity of the WASSI was assessed in a study with 113 high school students (64 freshmen and 49 juniors) from a school in upstate New York. The students completed the WASSI and produced two types of writing (i.e., freewrites and argument essays) during a single class period. Freewrites were 5-minute exercises in which students' brainstormed ideas and evidence for their

essays (see Appendix B for essay instructions, Appendix C from essay prompts, Appendix D for freewrite instructions, and Appendix E for freewrite prompts). A rubric to assess freewrite quality was developed and used by Weston, Crossley, and McNamara (2010, in press) based on SAT-style essay rubrics (see Appendix F for rubric). The rubric focuses on those aspects believed to be important to freewriting including the development of ideas and the use of appropriate examples. Unlike higher-quality essays, higher-quality freewrites do not need to be fully coherent, well organized, or grammatical. These freewrite quality scores were used to assess the validity of the brainstorming scale. Essays were prompt-based persuasive essays in which students chose and defended a position on a prompt.

Essays were scored using the SAT essay rubric (see Appendix G), and quality scores were used to provide evidence of external relations for the WASSI scores. The freewrites and essays were scored both holistically and on a variety of subscales by expert graders. These expert raters were composition instructors from Mississippi State University who were trained on the rubrics. Raters had Master's degrees and at least three years of experience teaching English. Inter-rater agreement was assessed by computing the weighted Kappa for the scores assigned by the two raters. The weighted Kappa was .56, suggesting an acceptable level of agreement. Over 56% of the freewrites were scored the same by both raters, 40% had a difference of one point, and 3% had a difference of two points. If the scores varied, the final freewrite score was computed as an average of the two given scores. The average correlation of scores between raters for essay score was .84. Over 60% of the essays were scored the same by both raters, 38% has a

difference of one point, and 2% had a difference of two points. If the scores varied by more than one point the score was decided by an additional rater.

WASSI-1 results. Table 1 presents Cronbach's alpha values for the WASSI total score and subscales as well as their correlations with essay and freewrite scores. The WASSI was designed to cover the overall construct of writing by targeting eight of the individual facets involved in writing proficiency. The total score for the WASSI was derived by summing the responses after reverse scoring negatively worded questions. The content-based subscale scores were derived by summing the responses for questions in each subscale. The internal consistency for each subscale was assessed. Internal consistency for the WASSI total score was excellent (.95) and very good for five of the eight subscales: Brainstorming, Planning, Revising, Attitudes, and Self-Efficacy. Alpha values for the Cohesion and Introductions/Conclusions subscales were initially below the acceptable threshold of .70. However, after eliminating items with low item-total correlations (below .30), the alpha value for Introductions/Conclusions rose to .63, and the alpha value for Cohesion increased to .76. The internal consistency of the paraphrasing scale remained well below acceptable levels despite corrections.

There was a positive correlation between WASSI total scores and essay scores ($r = .46$, $p < .001$; see Table 1), indicating that students with overall greater writing strategy knowledge and positive attitudes and self-efficacy wrote better essays. Correlations between subscale scores and essay scores were universally positive, and all correlations were significant except those for Paraphrasing and Writing Attitudes. WASSI total score was also significantly correlated with freewrite scores ($r = .42$, $p = .004$). With regards to subscales, the Brainstorming subscale was the most strongly associated with freewrite

quality. The Introductions and Conclusions scale was the least correlated with freewrite quality. The lack of correlation between the Introduction and Conclusion subscale and freewrite quality is not surprising because freewrites would be unlikely to have introductions and conclusions. Freewrites were scored on number of ideas generated and not on the use conventional structures generally found in essays (i.e., introductions, body paragraphs, and conclusions).

Table 1
WASSI scale Cronbach's alpha values and correlations with writing samples

		Essays		Freewrites	
	Cronbach's alpha	*r*	*p*	*r*	*p*
WASSI Total	.95	.46	< .001	.42	.004
Subscales					
Brainstorming	.80	.33	.06	.41	<.001
Planning	.81	.38	.02	.31	.01
Introductions/Conclusions	.54	.31	.01	.15	.22
Revising	.91	.41	< .001	.30	.02
Cohesion	.51	.42	< .001	.37	.002
Attitudes	.87	.20	.11	.23	.06
Self-Efficacy	.85	.38	.02	.30	.01
Paraphrasing	.20	.21	.08	.23	.06

Scale changes. Overall, the initial WASSI measure was shown to be moderately reliable and correlated with essay and freewrite quality, which is initial evidence of

construct validity. However, the measure was both long and unbalanced, with some of the scales having twice as many items as others. The Paraphrasing scale items were dropped due to the extremely low alpha level of the scale. Additional reasons for eliminating this scale were that this scale focused more on source-based writing than argumentative writing, and because students did not seem to understand the nature of self paraphrasing.

The Cohesion scale was maintained for three reasons. First, the potential importance of cohesion to writing quality strongly motivated maintaining this subscale. Second, the alpha level of .63 approached the cutoff of .70 after removing items that had low item–total correlations. Third, weaknesses in the remaining items were readily apparent, and it was judged that improving their clarity would further improve the reliability of the subscale. In addition to removing the Paraphrasing scale, the number of items composing each of the remaining scales was adjusted to include an equal number of positively worded (i.e., 5) and negatively worded (i.e., 5) items. Items were first removed based on item–total correlations (below .30), with some items retained due to the importance of their content to assessing the construct. The latter poor performing items that targeted necessary constructs were examined by a focus group and edited to improve clarity. The focus group found that many of these poor items were too long, confusing, or both. Many of the items on the WASSI-1 were subsequently reworded to maintain equivalent simplicity, length, and ease of understanding across items. The resulting 70-item measure, referred to as the WASSI-2 (see Appendix H), along with the resulting reliability and validity evidence is detailed in subsequent sections.

Writing apprehension. All participants also completed the Daly–Miller Writing Apprehension Test (WAT; Daly & Miller, 1975; see Appendix K). The WAT is a multi-

dimensional scale, measuring three distinct aspects of writing apprehension: Evaluation Apprehension, Stress Apprehension, and Product Apprehension. Evaluation Apprehension measures students' expectations of poor performance; Stress Apprehension measures a person's inability to start, plan, and organize a piece of writing; and Product Apprehension measures students' attitude towards writing. Reliability of the WAT scores has been assessed in two ways—by use of a split-half procedure test and the test-retest method. The split-half reliability coefficient of .94 suggests that the WAT has appropriate internal consistency. The test-retest method assesses temporal consistency and the WAT displayed appropriate reliability with a coefficient of .92. Validity evidence for this measure is generally lacking with only face and predictive validity assessed. For predictive validity the researcher assessed self-report of writing apprehension along with self-reports of writing requirements on the job. Previous research by Daly and McCroskey (1975) suggested that individuals who displayed higher levels of communication apprehension chose jobs they saw as having fewer communication requirements. The assessment of the WAT suggested that those with a greater level of writing apprehension perceived their jobs to have fewer writing requirements. Predictive validity is important in an assessment; however, the authors did not report if they established that the WAT assesses writing apprehension using external indicators, which is a key step in test validation.

The relationships between several WASSI-2 subscales and WAT subscales are especially pertinent for the establishment of convergent validity for the WASSI-2. The WAT Evaluation Apprehension subscale measures students' expectations of poor performance, whereas the WASSI-2 Self-Efficacy scale (in theory) measures the opposite

expectation. As expected, it is hypothesized that these scales should be significantly and negatively correlated. The WAT Stress Apprehension subscale measures a person's inability to start, plan, and organize a piece of writing. Not surprisingly, it is hypothesized that this scale will significantly and negatively correlate with the WASSI-2 scales pertaining to Brainstorming and Planning. Finally, the WAT Product Evaluation Apprehension subscale measures students' attitude towards writing; higher scores indicated more negative feelings. This scale should significantly and negatively correlate with the WASSI-2 Writing Attitudes scale.

Impression management. The Children's Social Desirability Scale (CSD; Crandall, Crandall, & Katkovsky, 1965) was used to assess the effects of a potential confound on self-report inventories such as the WASSI-2. This potential confound, impression management (a component of social desirability) is a bias toward reporting only those behaviors, feelings, and thoughts that present the responder in a positive light. The CSD was selected because of the inapplicability of many of the questions on adult measures with the high school population. Granted, some of the children's items may not be applicable to the high school students, but we chose to use a single scale that would adequately assess as much of our target population as possible (high school students, generally age 14 – 19).

The CSD (Crandall et al., 1965) is a 48-item True/False measure of social desirability that presents participants with experiences they may have encountered and inquires if the statement is or is not like the answerer. The CSD was assessed with split-half reliability and test-retest reliability. Internal consistency was assessed via split-half reliability. The authors give a range of values for the reliability coefficient for split-half

administration, α = .82-.95, noting the actual value depended on the comparison. Temporal consistency for the CSD was assessed using the test-retest method of reliability assessment, the reliability coefficient for the format administered to the older participants (grades 6-12) was α =.85. Traditional validity evidence for the CSD was not discussed, but comparisons were made between the genders and grade level. Crandall and colleagues reported that females responded in more socially desirable ways across all grade levels. In addition, they found that socially desirable responding decreased with age. In the current study, it was predicted that if participants are using impression management, then there should be a significant correlation with the WASSI scores. A non-significant correlation would support the assertion that the WASSI-2 questions are worded in such a way that does not induce socially desirable responding.

Measures of writing ability and achievement. All participants completed an SAT-style persuasive essay prior to completing the WASSI (see Appendix F for instructions and prompt). These essays were rated by expert raters with backgrounds in English composition (see Appendix G for SAT Scoring guide). Raters held Master's degrees in related fields and had at least 3 years teaching experience. All raters were trained to rate essays using the SAT scoring guide. It is hypothesized that students who report using more writing strategies will score better on the essays than students who report less writing strategy use. Correlations between the WASSI-2 total score and the WASSI-2 subscales and the essay scores will be computed to assess if this hypothesized relationship exists. The raters demonstrated fair agreement (*weighted kappa* = .39*)*, giving an essay the same score 43% of the time, and a score within one point of the other

rater 56% of the time. Scores for two essays varied by two points and thus the scores for these essays were decided by adjudication. Each rater rated each essay on a 1-6 scale.

Participants

The participants were 362 high school English students enrolled in a suburban public high school in Webster, New York. They included 29 freshmen, 175 sophomores, and 156 juniors. Approximately 52% were adolescent females, and approximately 48% were adolescent males. The average age of participants was 15.6 years old (*SD* = .75), and age ranged from 14 to 18 years old.

Procedure

Consent for student participation in this study was obtained by way of a passive consent form sent home with students (see Appendix N). Teachers had the opportunity to volunteer for this study and five teachers allowed their classes to participate. Other teachers were interested but were not able to participate due to conflicts with previously scheduled class activities. Administration took place during the students' normally scheduled English classes in their normal classrooms. Teachers were present during the administration though many stepped out for part of the time and were not there for the entirety of the administration. All administrations were proctored by a single graduate student experimenter. All assessment tasks were included in a single packet distributed to students. Materials were presented in the following order: the prompt-based essay, the WASSI-2, the WAT, the CSD, and a demographics form (see Appendix I for an example packet). After packets were distributed to students, directions for the prompt-based essay (see Appendix B) were read and students were allotted 15 minutes to complete the essay. The essay was shortened to 15 minutes from the standard 25-minute administration to

allow for assessment during a single class period. When the essay time had expired, the students were instructed to move onto the survey portion of the packet. They were instructed to raise their hand when they had finished the survey so that the experimenter could check that the survey was completely filled out.

Results

Data Screening

Data distribution. Results were assessed to ensure that all items had a full range of answers and that the data was normally distributed. The responses for all items encompassed the full range (1-6 for the WASSI-2, 1-5 for the Daly-Miller and T/F for the CSD). Considering the cut offs of skew less than 3 and kurtosis less than 10, all item-level variables were normally distributed. However, if a more stringent cut off was used for skew and kurtosis (+/- 2 for both), a few item-level variables were problematic. The variable from the Introductions and Conclusions subscale item number 29, "I do not include an introduction in my paper," suffers from both skew and kurtosis (Skew = -2.82, Kurtosis = 9.15). Other variables that suffered from kurtosis were also from the Introductions and Conclusions subscale (i.e., items 27 and 57).

Outliers. Though univariate outliers were present in the current data set, they were not considered to be problematic due to the restricted range of the answers. For this reason the data from these subjects were not eliminated. Mahalanobis Distance suggests that some multivariate outliers exist in this data set; however, given that all other checks of normality have been passed and Maximum Likelihood Estimation is robust to problems with normality, these observations were maintained in the data set.

Multicollinearity. Examination of correlations among variables did not reveal any correlations greater than .90, suggesting that multicollinearity was not a significant concern with the data.

Missing data.

WASSI-2. A small percentage of the data contained missing values; 11 subjects, or 3% of the data. Each participant with missing data only skipped one question on the WASSI-2 and no item was skipped more than once. With such a small percentage of the data missing, these observations were eliminated using listwise deletion from the subsequent analyses.

Daly-Miller WAT. Nine participants skipped items on the Daly-Miller WAT. Only one of these participants skipped more than one item. The participants who skipped only one item had their scores computed without that item. The participant who did not finish the WAT was dropped from the analyses that included the WAT. In addition participants who skipped any item were not included in the WAT subscale analysis because missing values result in a greater relative discrepancy in these scales.

Children's Social Desirability Scale. A small number of participants (7) did not finish the CSD. Additionally, one participant skipped multiple items (10); this participant along with those who did not finish were dropped from the analyses that included the CSD. An additional 15 participants skipped only one question and their scores were computed without this value.

Reliability

Internal consistency. Estimates of the WASSI-2 internal consistency (Cronbach's alpha) are provided in Table 2, along with those for WASSI-1 for ease of

comparison. Cronbach's alpha for the WASSI-2 total score was .94, and subscale alphas ranged from .71 to .85 (Table 2), all above the threshold of .70. Based on item–total correlations in the full measure, only one item was targeted for elimination due to low item–total correlations (i.e., less than .25). The item targeted for elimination was items 5 ('I repeat my thesis in the conclusion section of my papers', Introductions and Conclusions). Due to the low item–total correlation, for the subsequent analyses, this item was deleted. After item elimination, all of the subscales had alpha levels above .74 (see Table 2).

Table 2
Cronbach's alpha values for WASSI-1 and WASSI-2.

	Cronbach's alpha values		
	WASSI-1	WASSI-2	WASSI-2 (with item deletion)
WASSI Total	.95	.94	.94
Subscales			
Brainstorming	.80	.78	.78
Planning	.81	.81	.81
Introductions/Conclusions	.54	.71	.74
Revising	.91	.79	.79
Cohesion	.51	.80	.80
Attitudes	.87	.82	.82
Self-Efficacy	.85	.85	.85

Factor Structure of the WASSI

Confirmatory factor analysis was used to assess seven different *a priori* models. The WASSI was developed to be a multi-faceted scale. Thus, a single factor model was assessed, along with a two-factor model (including Attitudes/Self-efficacy and Writing Strategies), three-factor model (including Strategies, Attitudes, and Self-efficacy factors), two different four-factor models (one including Prewriting, Drafting, Attitudes, and Self-efficacy factors and another including Prewriting, Introductions and Conclusions, Post-writing, and Attitude/Self-efficacy factors), a five-factor model (including Prewriting, Drafting, Post-writing, Attitudes, and Self-efficacy factors), and a seven-factor model (using items from the seven aforementioned subscales to form the factors; see Table 3 for list of factors).

The one-factor model has all 67 retained items loading onto a single latent variable. The seven-factor model tests the intended design of the measure with each of the seven scales loading onto their own factor. In addition to the individual scales, three additional scales were created. When the Prewriting factor was assessed, it contained a combination of items from the Brainstorming and Planning scales. The Drafting scale encompasses items from Introductions and Conclusions, Revision and Cohesion. The Post-writing factor contains the items from the Revision and Cohesion scales. These groupings of scales were postulated as possible factors because planning and freewriting are both part of prewriting and because cohesion can be added during the revision phase of writing. All analyses were conducted using Maximum Likelihood Estimation in AMOS. When modifications to the model were suggested, they were completed in a stepwise fashion. Modifications were only made to the best fitting model. Only

modification suggestions that concern the loading of items onto latent variables were considered. After each model modification, the model was reanalyzed and the next most influential modification suggestion was considered. This process was repeated until the ten steps were completed (see complete list of changes in Table 4 following the model discussion). All models were assessed for negative variance estimates, non-significant factor loadings, and standardized estimates greater than one. None of these problems were found with any of the models presented.

Fit statistics used to assess fit for this model and all subsequent models included the Chi-square value (ideally non-significant), the standardized root mean square residual (SRMR; ideally less than .08), the Root Mean Square Error Approximation (RMSEA; less than .08), the Tucker Lewis Index (TLI; greater than .95), and the comparative fit index (CFI; greater than .95) (Hu & Bentler, 1998, 1999).

Table 3
Factor Models for the WASSI

2 Factor	3 Factor	4 Factor A	4 Factor B	5 Factor	7 Factor
Attitudes/ Self-efficacy (AT/SE)	Attitudes (AT)	Attitudes (AT)	Attitudes/ Self-efficacy (AT/SE)	Attitudes (AT)	Attitudes (AT)
Strategies	Self-efficacy (SE)	Self-efficacy (SE)	Prewriting (PRE)	Self-efficacy (SE)	Self-efficacy (SE)
	Strategies	Prewriting (PRE)	Introduction/ Conclusions (IC)	Prewriting (PRE)	Brainstorming (BS)
		Drafting	Post-writing (Post)	Introduction/ Conclusions (IC)	Planning (PLAN)
				Post-writing (POST)	Introduction/ Conclusions (IC)
					Cohesion (COH)
					Reviewing and Revising (RR)

One-Latent Variable Model. The one-factor model had all 67 retained items loaded onto a single latent variable. This model assessed the WASSI-2R Total Score, by assessing a model with all items loading onto a single latent factor. This initial model displayed relatively poor fit, with the Chi-square value for this model statistically significant, χ^2 (2277) = 6075.65, $p < .001$. The SRMR (.076) and the RMSEA (.069) met

the acceptable value of below .80. Additionally the TLI and the CFI were both below acceptable thresholds (.550 and .564 respectively).

Two-Latent-Variable Model. The two-latent variable model assessed a Strategies factor and a factor representing Attitudes/Self-Efficacy. The strategies factor was comprised of all items that were written to assess writing strategy use. The Attitudes/Self-Efficacy factor consisted of all of the items written for those two scales. This two-latent-variable model also displayed poor overall fit, though there were improvements over the one latent variable model, $\chi^2_{diff}(1) = 441.00$, $p < .001$. The Chi-square value for this model improved but was statistically significant, $\chi^2 (2276) = 5634.65$, $p < .001$. The SRMR value of .073, and the RMESA value of .065 met the acceptable threshold of values less than .08. The TLI and CFI also improved (.60 and .62 respectively), but were below acceptable levels

Three-Latent-Variable Model. The three-latent-variable model (Attitudes, Self-efficacy, and Strategies) improved upon the fit of the previous model, $\chi^2_{diff}(2) = 445.70$, $p < .001$. The chi-square value was still significant, though it had a lower value than the prior models, $\chi^2(2774) = 5288.95$, $p < .001$. The SRMR value of .072 and the RMSEA value of .061 met the acceptable threshold and the TLI and CFI improved from (some) previous models, though they did not meet minimum standards (.66 and .67 respectively).

Four-Latent-Variable Model (A). The four-latent-variable model (Attitudes, Self-efficacy, Prewriting, and Drafting) improved upon the fit of the previous models. The Prewriting factor contained a combination of items from the Brainstorming and Planning scales. The Drafting scale contained items from Introductions and Conclusions, Revision and Cohesion. The chi-square value was significant, though it had a lower value

than the prior models, $\chi^2(2138) = 4533.71$, $p < .001$; $\chi^2_{diff}(3) = 358.93$, $p < .001$. The SRMR value of .075 met the acceptable threshold but was higher than in some of the previous models. The RMSEA value dropped (.057), suggesting better fit. The TLI and CFI values of (.70 and .71 respectively) were the best of initial models thus far, but did not meet minimum standards.

Four-Latent-Variable Model (B). The alternate four-latent-variable (Attitudes/Self-efficacy, Prewriting, Introductions/Conclusions, and Post-writing) model did not perform as well as the first four-latent-variable model. The Post-writing factor contained the items from the Revision and Cohesion scales. This scale grouping was made because elements of cohesion can be added during the revision process. The chi-square value was significant, $\chi^2 (2271) = 5239.84$, $p < .001$, and although this model did not improve upon the fit from the previous four-factor model, it did perform better than the three-factor model, $\chi^2_{diff}(3) = 50.89$, $p < .001$. When comparing non-nested models the χ^2difference test is not appropriate, instead of models of this nature are compared using AIC values. The AIC value for the current model, 5527.84 is higher than the AIC value for the alternative four-factor model, 5118.02, suggesting that the prior four-factor model fits the data better (Akaike, 1987). The SRMR value of .077 met the acceptable threshold but was higher than the value in the competing four-latent-variable model. The RMSEA value of .061 was higher than the competing four-factor model, suggesting worse fit. The TLI and CFI values of (.65 and .66 respectively) did not meet minimum standards and provided no benefit over previous models.

Five-Latent-Variable Model. The five-latent-variable model (Attitudes, Self-efficacy, Prewriting, Post-writing, and Introductions/Conclusions) improved upon the fit of the previous models. The chi-square value was significant, though it had a lower value than the prior models χ^2 (2267) = 4789.28, p <.001, $\chi^2_{diff}(4) = 40.74$, $p < .001$. The SRMR value of .075, and the RMSEA value of .056 met the acceptable threshold, and though the TLI and CFI improved in comparison to prior models, they did not meet minimum standards (.70 and .71 respectively).

Seven-Latent-Variable Model. The seven latent variable model (Attitudes, Self-efficacy, Brainstorming, Planning, Introductions/Conclusions, Cohesion, and Reviewing/Revising) displayed better fit than the previous models, but was still not ideal, $\chi^2_{diff}(11) = 154.202$, $p < .001$. The Chi-square value for this model was statistically significant, χ^2 (2256) = 4635.08, $p < .001$). The SRMR value (.074) and the RMSEA value (.055) were within acceptable values. The TLI and NFI were both below acceptable levels, but performed better in this initial model than in previous models (.72 and .73 respectively). Because this model was the best fitting of all of the models tested, the following changes were made based on the modification indices: items 11 and 35 were allowed to load onto the Self-Efficacy factor and their paths were removed from the Brainstorming factor. Item 7 was allowed to load onto the Attitudes factor in addition to the Brainstorming factor. In addition, item 12 was allowed to load on to the Attitudes factor in addition to the Planning factor. Item 3 was allowed to load onto the Introductions/Conclusions factor in addition to the Brainstorming factor. Item 31 was allowed to load onto the Cohesion factor in addition to the Brainstorming factor. Item 43 was allowed to load onto the Cohesion factor in addition to the Planning factor. Finally,

item 58 was allowed to load onto the Brainstorming factor in addition to the Reviewing/Revising factor. The subsequent model displayed superior fit to the original model, χ^2 (2250) = 4240.35, p <.001, $\chi^2_{diff}(6) = 394.73$, $p < .001$. The TLI and the CFI increased (.76 and .77 respectively) and were the highest of any model, but were still below acceptable levels, and the SRMR (.059) and the RMSEA (.050) dropped, suggesting increased fit.

Model Comparison. Overall, none of these models adequately fit the data (See Tables 4 for summary of model fit statistics); however, the best fitting model (after modifications) was the seven latent variable model. A chi-square difference test with the next best performing model (five latent variable model), $\chi^2_{diff}(6) = 394.73$, $p < .001$, suggests that the seven latent variable model reflects the nature of the relationship among the variables better than the five latent variable model.

Table 4
Model Comparisons: WASSI Models

	Initial Model						
	χ^2	*df*	*p*	SRMR	RMSEA	TLI	CFI
Model Number							
1	6075.65	2277	<.001	.077	.069	.55	.56
2	5634.65	2276	<.001	.073	.065	.60	.62
3	5188.95	2774	<.001	.072	.061	.66	.67
4a	4830.02	2271	<.001	.075	.057	.70	.71
4b	5239.84	2271	<.001	.076	.061	.65	.66
5	4789.28	2267	<.001	.075	.056	.70	.71
7	4635.08	2256	<.001	.074	.055	.72	.73
7 Modified	4240.35	2250	<.001	.059	.050	.76	.77

Revised WASSI Scales and Reliability

Following the modifications used in the final seven-factor model, items were both added to and deleted from the WASSI-2 subscales. Items 11 ("I cannot think of good ideas to include in a paper") and 35 ("I cannot think of many ideas that meet the requirements of the assignment") were added to the Self-efficacy scale. The focus of items 11 and 35 on the ability to complete a task aligns with the Self-efficacy items, making this change theoretically sound. These items were also removed from the Brainstorming scale, which again may have to do with their focus on perceived abilities. In addition, Item 7 ("I come up with more ideas than I need for a paper") and 12 ("I develop an outline reflecting the order of what I am going to say before I start writing") were added to the Attitudes scale. These edits suggest that how a person responds to attitude items is related to how they respond to these two items from prewriting. This pattern of responding implies prewriting activities may be influenced by attitudes towards writing. Items 3 ("I feel that thinking about what I need to write is a waste of time") was added to the Introductions/Conclusions scale. Many of the items contained on the Introductions/Conclusions scale concern the respondent's feeling of worth of different aspects of writing, which may explain why these two items loaded onto this factor. Item 31("I consider many ideas before I start writing a paper") was added to the Cohesion scale. This loading may be because gathering ideas could make it easier to write a cohesive essay. Additionally, item 43 ("I do not map ideas to help organize my paper before I start writing") was added to the Cohesion scale. This loading suggests that mapping ideas is related to using cohesion strategies. Mapping ideas may make it easier to write cohesive essays. Finally, Item 58 ("I revise my sentences and paragraphs while I

am writing") was added to the Brainstorming scale. This modification suggests that brainstorming is related to on-line editing. New internal consistency values all meet minimum acceptable values ($\alpha > .70$) and the values, along with the previous scale alphas are presented in Table 5 for comparison.

Table 5
Cronbach's Alpha Values for Revised Subscales

Scale	Old Scale α	New Scale α
Brainstorming	.78	.74
Planning	.81	.81
Introductions/Conclusions	.74	.75
Cohesion	.80	.81
Reviewing and Revising	.79	.79
Attitudes	.82	.82
Self-efficacy	.85	.87

Validity

Daly-Miller Writing Apprehension Test. The Daly-Miller WAT displayed adequate internal consistency, $\alpha = .932$. The internal consistency was assessed for the Daly-Miller subscales, the alpha levels were appropriate for the Evaluation Apprehension and the Stress Apprehension scales ($\alpha = .90$ and .84 respectively). However, the internal consistency for the Product Apprehension scale did not meet the minimum acceptable value, $\alpha = .66$. The correlations between the scores from the revised WASSI-2 and scores from the Daly-Miller Writing Apprehension Test (WAT; Daly & Miller, 1975) were computed. Correlations were computed both between the WASSI-2 total score and the Daly-Miller WAT total score and between the WASSI-2 content-based subscale scores and the Daly-Miller WAT subscale scores. A strong, statistically significant, negative

correlation was found between the WASSI total score and the Daly-Miller WAT total score (r = -.77, p <.001). This correlation indicates that those displaying greater amounts of writing apprehension use fewer writing strategies (see Table 6). As expected, the WAT Evaluation Apprehension subscale, a measure of students' expectations of poor performance, was significantly and negatively correlated with the WASSI-2 Self-efficacy scale (r = -.80, p <.001). In addition, the WAT Stress Apprehension subscale, a measure of a person's inability to start, plan, and organize a piece of writing, was significantly and negatively correlated with the WASSI-2 scales pertaining to Brainstorming and Planning (r = -.46, p <.001; and r = -.42, p < .001 respectively). However, stronger negative correlations were found with all of the other subscales (see Table 6).The strongest negative correlation with the Stress Apprehension subscale was with the WASSI-2 Writing Attitudes scale. Finally, as expected, the WAT Product Evaluation Apprehension subscale, a measure of students' attitude towards writing, with higher scores indicating more negative feelings, was significantly, negatively correlated with the WASSI-2 Attitudes scale (r = -.74, p < .001).

Table 6
Correlations Between Daly-Miller and WASSI-2 Scores

	WASSI-2 Scales							
	Total score	SE	AT	BS	PLAN	COH	RR	IC
Daly-Miller Scales								
Total Score	-.77	-.77	-.76	-.43	-.42	-.61	-.50	-.49
Evaluation Apprehension	-.71	-.80	-.64	-.36	-.37	-.59	-.47	-.47
Stress Apprehension	-.75	-.66	-.82	-.46	-.42	-.58	-.46	-.46
Product Apprehension	-.61	-0.47	-.74	-.38	-.36	-.43	-.39	-.35

Note. All correlations significant at p <.001.

Children's Social Desirability Scale. The correlation between the CSD score and the WASSI-2 total score was low but significant, $r = .20$, $p < .001$. In addition, significant correlations were found between the CSD and many of the subscales of the WASSI-2 (see Table 7). The correlations between CSD and the WASSI-2 differ by grade level (see Table 7) and were assessed using Fisher's r to z transformation (Fisher, 1915), $z = 1.88$, $p = .03$. However, differences between the group means were not significant, $F(2,324) = .085$, $p = .92$.

Table 7
Correlations Between WASSI-2, Subscales and CSD

	R	*p*
WASSI-2 Total Score (all students)	. 20	<.001
WASSI-2 Total Score (9th grade)	.15	.445
WASSI-2 Total Score (10th grade)	.31	<.001
WASSI-2 Total Score (11th grade)	.10	.262
Brainstorming	.19	.001
Planning	.14	.010
Introductions/Conclusions	.18	.001
Cohesion	.18	.001
Reviewing and Revising	.18	.001
Attitudes	.15	.006
Self-efficacy	.11	.055

Student writing samples. The mean essay score was $M = 2.6$, $SD = .77$. The high score for these essays was 5.5. The correlation between essay score and WASSI-2 Total score was both positive and significant, $r = .37$, $p < .001$. In addition, all of the correlations with WASSI-2 subscales were both positive and significant (see Table 10 for complete list of correlations with WASSI subscales).

Table 8
Correlations Between WASSI Subscales and Essay Score

Scale	*r*
Brainstorming	.12*
Planning	.21**
Introductions/Conclusions	.32**
Cohesion	.29**
Reviewing and Revising	.28**
Attitudes	.35**
Self-efficacy	.32**

Note. ** $p < .001$, * $p < .05$.

Discussion

This evaluation of the WASSI-2 suggests that the revisions made to the initial WASSI resulted in an improved measure. Some of the alpha values dropped from WASSI-1 to WASSI-2, but they were generally comparable and, at times, exceeded the previous values. The WASSI-2 is a more concise measure than the original WASSI (69 items versus 108 items), but still covers the breadth of material it was designed to encompass. However, none of the tested factor models adequately represent the

underlying structure of the measure, but the intended factor structure (i.e., the seven factors) performed best among all the models tested.

The revised seven-factor model displayed an appropriate Standardized Root Mean Square Residual value (SRMR = .059) and Root Mean Square Error of Approximation value (.050). In addition, the model displayed the highest Tucker Lewis Index and Comparative Fit Index of any of the tested models. One reason for the general lack of fit may be due to the low sample size (N = 350). One rule of thumb states that ten participants per item is the minimum needed for confirmatory factor analysis, though some espouse much larger item to participant ratios. Considering the 1:10 ratio of items to participants, this sample needs to be double in size to meet the minimum number. Fit statistics need to be evaluated with care for models built using small sample sizes, as many of these tests are sensitive to small sample sizes. The χ^2 statistic is particularly sensitive to sample size, yielding questionably accurate results, both when too many variables are included in the model and when too few are included (Schermellah-Engel, Moosbrugger, & Müller, 2003). There is no way to circumvent the problem of sample size, but Jöreskog and Sörborm (1993) have suggested an alternative way to assess the χ^2 statistic. They propose that a model with good fit will display a ratio of χ^2 to degrees of freedom of between 2 and 3. Though this does not eliminate the problem of sample size, it does allow for a less sample size susceptible assessment of the χ^2 value. When considering this formula, all of the WASSI models show relatively good fit with values ranging from 1.9 – 2.4. The TLI and CFI are less susceptible to sample size than other fit statistics (Bentler, 1990), but still fail to reach significance, suggesting misfit somewhere in the model. This being said, most fit statistics penalize for complexity for the model,

and with the best fitting model here also being the most complex, one can postulate that with a larger sample size this factor structure may show appropriate fit.

One way to increase fit in a model is by adding or removing paths as suggested by the modification indices. Changes made to the seven-factor model were made only by adding/removing paths between items and factors. In general, adding paths between error residuals without theoretical justification is frowned upon. For this reason none of these paths were added to this model. However, one way to increase fit in the present model would be to add some of these paths, and theoretical justification exists to add these paths. Future work on this scale will concern the adding of these correlated residuals followed by a cross-validation with an independent data set.

Regardless of poor fit, this study moved forward using the modifications suggested in the seven-factor model. The resulting version of the WASSI-2 showed appropriate Cronbach's alpha values across all subscales and was used for all further testing of the WASSI-2. Validity for the WASSI-2 was assessed in three ways: using the Daly-Miller Writing Apprehension Test (WAT), the Children's Social Desirability Scale (CSD), and expert scores from student SAT-style essays. The validity evidence for the WASSI-2 was generally positive with all hypothesized relationships present.

As expected, the WAT (and included subscales) correlated both negatively and significantly with the WASSI-2 and its subscales. These findings provide convergent validity evidence for the WASSI-2. The strong negative correlation between the WAT-total score and the WASSI-2 total score suggests that students who display greater amounts of writing apprehension utilize fewer writing strategies. Furthermore, the Evaluation Apprehension subscale's significant negative correlation with the Self-

efficacy scale suggests that they are (as designed) assessing the same constructs, though in differing directions (a high score on the WASSI-SE scale denotes a larger amount of self-efficacy, whereas a high score on the Evaluation Apprehension scale denotes low self-efficacy for writing). Each of the other WASSI-2 subscales also correlated significantly and negatively with this Daly-Miller subscale. The correlation between the WASSI-2 and the WAT suggests that those who display lower self-efficacy for writing also use fewer writing strategies (or at least report so). As anticipated, the Daly-Miller Stress Apprehension scale displayed significant negative correlations with the WASSI-2 subscales for Brainstorming and Planning; however, stronger correlations were found between this scale and all of the other subscales (along with the total score), signifying that those who self-report experiencing apprehension early in the writing process also report using fewer writing strategies (across all subscale categories). The strong correlations between the Stress Apprehension scale and the Attitudes and Self-efficacy scales suggest that the more a person reports Stress Apprehension the more likely they are to report having a negative outlook on both writing and their abilities as a writer. The Product Apprehension subscale from the WAT, which measures student's general disdain for writing, correlates most highly (and negatively) with the WASSI-2 Attitudes subscale, suggesting that, as designed, they are assessing the same construct in alternate directions. This scale also correlates significantly with the other WASSI-2 subscales though not to the same magnitude, suggesting that there is a negative relationship between dislike of writing and strategy use. Whether the lack of strategy use causes the dislike of writing or vice versa is a question that should be assessed in future work.

The WASSI-2 was further validated using an impression management scale and student essay scores. The correlation between the CSD and the WASSI-2 indicates that social desirability bias may undermine the accuracy of the responses. However, the impact of social desirability seems to have a more pronounced effect on WASSI-2 scores for 9th and 10th grade students than for the 11th grade students. This finding is consistent with Crandall et al.'s (1965) finding that social desirability attenuates with age. Mean differences were not found between the grade levels; however, this may be due to the lack of variability in scores. This lack of variation may be due to the response format, true-false, that is scored zero or one. For each socially desirable answer the participant gained one point, thus the scores can range between 0 and 48. Over 75% of the present sample scored 23 or below, meaning that they answered in a socially desirable way to less than half of the items, however, Crandall et al. do not suggest a cut-off value for social desirability, preventing the isolated assessment of their social desirability. This finding suggests that item revisions may be necessary, at least in terms of reducing social desirability. Additionally, the WASSI-2 scores were correlated with student essay scores. Essay scores displayed a moderate positive correlation with WASSI-2 total scores. This finding suggests that those who report using more writing strategies also score higher on prompt-based essays. The only subscale to show a non-significant correlation with essay score was the Brainstorming scale. This relationship, along with the weak (but significant) correlation with the Planning subscale goes against the long standing view that those who use more prewriting strategies perform better on writing tasks. This finding may be attributable to the nature of the writing task completed by the students. When writing a 15-minute (or other time limited) essay, prewriting may not be beneficial

and/or may have little effect on essay score. The strongest correlation between essay score and subscale scores was with the Attitudes scale, supporting previous research that writing attitudes have a significant and positive effect of writing. Overall, all of the validity evidence is positive for the WASSI-2, suggesting that it is measuring what it is intended to measure. Although these results are promising, further data are needed to validate the WASSI-2 and to allow for a better understanding of its underlying structure.

In conclusion, a comprehensive measure of students' writing attitudes and strategies is needed to assess the diverse factors that contribute to students' writing skill and success. The Writing Attitudes and Strategy Self-Report Inventory, appears promising for achieving this goal. The WASSI-2 provides a powerful tool for researchers and educators to explore how students engage in the writing process. It has been shown to correlate appropriately with some of the factors used to assess convergent and divergent validity (student essays, WAT). The converging reliability and validity evidence for the WASSI-2 suggest that it will be an ideal tool for assessing student writing strategy use and deficits for targeted interventions.

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Appendices

Appendix A
WASSI-1

Read the following items and circle the response that best represents your recent writing experiences.
Use the following scale:

1 = Strongly disagree 2 = Moderately disagree 3 = Slightly disagree
4 = Slightly agree 5= Moderately agree 6 = Strongly agree

1. It is so difficult for me to identify my writing errors that I don't review and revise my papers.
2. After writing the first complete draft of a paper, I review it to determine if it is convincing enough.
3. I don't think about choosing words carefully to maintain links with earlier parts of my paper.
4. I include a lot of quoted material in my papers.
5. I write sentences that are long and full of information.
6. I like to write about my thoughts and feelings.
7. While I am writing, I think about my goals and revise what I have already written if I have not met my goals.
8. I would rather read than write.
9. If I have trouble starting a paper, I keep trying until I have written something.
10. I don't feel confident about my ability to write.
11. Before I start writing, I don't consider what goals I want to achieve.
12. I write in a way that explains to readers exactly what the pronouns "this," "these," and "that" mean.
13. Before I start writing, I develop a plan for achieving my goals.
14. When I write a short essay, I think that mine will be one of the worst in my class.
15. I write conclusions that effectively pull all my thoughts together.
16. I think that outlines and visual maps of the ideas I will include in my papers are of little help to me.
17. I would rather write than complete math problems.
18. I like to write book reports.
19. I don't like to write papers where I defend or challenge an argument
20. I don't revise my sentences while I am writing.
21. Before I start writing, I have an organized plan for my paper.
22. I don't proofread my papers to ensure that I have used words that are appropriate for the readers of my papers.
23. When I write a research paper, I think that mine will be one of the best in my class.
24. I review my papers to ensure that I have made the necessary claims.
25. I review my papers to ensure that they meet the requirements.
26. I am not confident that I can express my ideas well in writing.
27. When I start writing a paper, I have already identified most of the ideas I will include in it.
28. I like to write short essays.
29. When generating sentences, I come up with short questions that help me write sentences that logically follow the sentence before them.
30. I write on my own outside of classes.
31. I feel confident that my first draft of a paper is strong enough to submit.
32. When I decide to write a paper, I start immediately.
33. I emphasize my most important arguments at the end of my papers.
34. I start recording ideas almost immediately after I read the directions for a paper.
35. Writing is a waste of time.

36. When I make a plan to write a paper, I am certain I can follow my plan.

37. It is rare that I try to figure out how all of my ideas are related before I start writing.

38. I strive to be creative when I write by using different words to describe the same thing across parts of my paper.

39. I don't create lists of ideas to include in a paper.

40. I revise my papers at least once.

41. While I am writing, I usually don't give much thought to the match between my goals and what I am writing.

42. Whenever I write a paper, I think that mine will be better than the other papers in my class.

43. I don't like to write research papers.

44. I don't like to write about my experiences.

45. Before submitting a paper, I don't read it again to determine if I am satisfied with it.

46. Before I start writing, I think about the best ways to meet the requirements of the writing assignment.

47. My papers would benefit from better word choices and better sentence structure.

48. I don't make notes before I start writing a paper.

49. I am confident that I can generate ideas about what to write.

50. I cannot think of good ideas to include in a paper.

51. I neglect to choose words carefully, so that different parts of my paper have different words describing the exact same thing.

52. I don't include conclusion sections in my papers.

53. I organize information into well-sequenced paragraphs that have a clear focus.

54. When writing, I paraphrase what I read.

55. It does not make sense for me to think about how I can make it easy for readers to understand my arguments.

56. Writing is an activity I enjoy.

57. I proofread my papers to ensure that I have used the best and most effective words to express my arguments.

58. When I encounter problems while writing, I have trouble overcoming them.

59. I don't develop a writing plan before I start writing.

60. I develop lists of varied ideas to include in a paper.

61. Most readers don't need me to write a conclusion because they will understand my most important arguments from reading the body of my paper.

62. I am not confident that I can organize my ideas well enough to write a good paper.

63. When I revise my papers, I change only errors that my teacher or a peer reviewer has pointed out to me.

64. I don't review my papers to ensure that I have supported my claims with good evidence.

65. I use the pronouns "this," "these," and "that" to start sentences.

66. I lack confidence in my writing skills.

67. It is rare that I develop an outline before I start writing.

68. When I write an argument paper, I think that mine will be one of the worst in my class.

69. When writing, I choose words carefully by considering what readers know and don't know.

70. I don't consider what readers probably know and probably don't know when writing.

71. I feel that thinking about what I need to write is a waste of time.

72. When I start writing a paper, I have a plan for how my paper will be organized.

73. I don't review my papers carefully enough to ensure that I answered the questions posed in the assignment.

74. I like to explain to readers what I believe without telling them first what my major points will be.

75. It seems unnecessary to review my papers carefully before submitting them.

76. I enjoy writing.

77. When writing, I first explain what I will be writing about.

78. While writing, I use my own words to restate ideas that I have read.

79. I proofread my papers for punctuation and grammatical errors.

80. When I encounter problems while writing, I quit.

81. I am not confident that I can correct the mistakes I have made in my papers.

82. I don't write sentences that are tied with common words or phrases to the sentences that come before them.

83. Before I start writing a paper, I write down every idea that could be included in it.

84. I organize my ideas after I start writing.

85. I repeat important words or phrases when I write sentences and paragraphs.

86. Before I start writing, I develop a visual map of ideas to show how I will organize the information in my paper.

87. When writing, I don't paraphrase what I read.

88. I quit while writing papers because writing is too difficult.

89. Before I start writing, I try to see how all of my ideas are related.

90. I write sentences that connect well together.

91. I don't review my papers to ensure that I have addressed opposing claims and their evidence.

92. I believe that it makes no sense for me to reword what professional writers have already written.

93. I avoid writing whenever I can.

94. I don't include an introduction in my papers.

95. I fail to link sequences of sentences together to ensure that nearby sentences address similar issues.

96. Before submitting a paper, I read it again to be certain someone else to can learn something from reading it.

97. When I write a book report, I think that mine will be one of the best in my class.

98. Writing is not an activity I enjoy.

99. When my teacher or a peer reviewer has identified an error in my paper, I try to fix this error as well as errors like it in other parts of my paper.

100. Before I start writing a paper, I consider a lot of different ideas.

101. I write short, to-the-point sentences.

102. I am confident that I can make all the changes to my papers that I need to make.

103. I revise a lot of my sentences and paragraphs while I am writing.

104. I review my papers to ensure that I have provided detailed evidence that supports the arguments for my claims.

105. I write introductions to attract the attention of readers.

106. When reviewing my own writing, I change the words and the sentence structure I have used.

107. Before I start writing, I develop an outline reflecting the order of what I am going to say.

108. When writing, I change the words and the sentence structure I have found in books and articles I have reviewed.

Appendix B
SAT Essay Instructions

You will now have 25 minutes to write an essay on the prompt below.
The essay gives you an opportunity to show how effectively you can develop and express ideas. You should, therefore, take care to develop your point of view, present your ideas logically and clearly, and use language precisely.
Your essay must be written on the provided answer sheet—you may raise your hand if you need more paper on which to write. Remember that people who are not familiar with your handwriting will read what you write. Try to write or print so that what you are writing is legible to those readers.
Important Reminders:

- An off-topic essay will receive a score of zero.
- If your essay does not reflect your original and individual work, your test scores may be canceled.
- Please remember that the experimenter cannot clarify the prompt or answer any questions for you.

Think carefully about the issue presented in the following excerpt and the assignment below.

Appendix C
Essay Prompts

Prompt 1: Memories

Many persons believe that to move up the ladder of success and achievement, they must forget their past, repress it, and let it go. But others have just the opposite view. They see their old memories as a chance to reckon with their past and integrate past and present.

Do personal memories hinder or help people in their effort to learn from their past and succeed in the present?

Prompt 2: Optimism

In many circumstances, optimism - the expectation that one's ideas and plans will always turn out for the best - is unwarranted. In these situations what is needed is not an upbeat view but a realistic one. There are times when people need to take a tough-minded view of the possibilities of success, give up, and invest their energies elsewhere rather than find reasons to continue to pursue the original project or idea.

Is it better for people to be realistic or optimistic?

Appendix D
Freewrite Instructions

Freewriting introduction

Freewriting is the process of generating a lot of ideas by writing non-stop. It allows you to focus on a specific topic, but forces you to write so quickly that you are unable to edit any of your ideas. The idea is simply to write for a set amount of time. In freewriting you don't stop. You never stop to look back, to cross something out, to wonder how to spell something, to wonder what word or thought to use, or to think about what you are doing. There are no wrong answers in freewriting. Irrelevant or useless information can be removed at a later stage of planning. . The only requirement of freewriting is that you never stop.

The main thing about freewriting is that it is *not edited*. It is an exercise in bringing together the process of producing words and putting them down on the page. When Practiced regularly, freewriting helps you to produce words and ideas quickly, without editing at the same time. It will make writing less blocked because words will come more easily.

You will have 5 minutes to freewrite on the following prompt. Please keep in mind that I am not able to clarify the prompt or the instructions for you. When told so you may begin.

Appendix E
Freewrite Prompts

Prompt 1: Choices

People today have so many choices. For instance, thirty years ago most television viewers could choose from only a few channels; today there are more than a hundred channels available. And choices do not just abound when it comes to the media. People have more options in almost every area of life. With so much to choose from, how can we not be happy?

Does having a large number of options to choose from increase or decrease satisfaction with the choices people make?

Prompt 2: Loyalty

Loyalty is one of the essential attributes a person must have and must demand of others. Being loyal, faithful, or dedicated to someone or something, is not always easy. People often have conflicting loyalties, and there are no guidelines that help them decide to what or to whom they should be loyal. Moreover, people may be loyal to something harmful or bad.

Should people always maintain their loyalties, or is it sometimes necessary to switch sides?

Prompt 3: Problems

Many people believe that our government should do more to solve our problems. People think that individuals do not have the ability to create jobs, build roads, improve schools, or help to provide the many other benefits that we have come to enjoy. However, expecting the government to come up with the solutions to society's problems may have made us less self-reliant and undermined our independence and self-sufficiency.

Should individuals or the government be responsible for solving problems that affect our communities and the nation in general?

Prompt 4: Risks

Many people lead careful and sensible lives. They watch their diet, exercise regularly, and check the weather report before leaving the house. They carefully control many aspects of their lives. Others believe that life should be more carefree and reckless, and people should not try to control what can't be fully controlled. They also take more chances, even against their better judgments.

Is it sometimes better to take risks than to follow a more reasonable course of action?

Appendix F
Holistic Freewrite Rubric

SCORE OF 6

A freewrite in this category demonstrates *clear and consistent mastery of freewriting*, although it may occasionally resemble an essay.

- Effectively and insightfully develops ideas on an issue with few unnecessary tangents.
- demonstrates outstanding critical thinking, using appropriate examples, reasons, and other evidence to support ideas
- is not well organized or clearly focused, occasionally demonstrating clear coherence, rarely demonstrating a smooth progression of ideas
- parts of free write exhibit skillful use of language, using a varied vocabulary
- demonstrates meaningful variety in sentence structure
- has errors in grammar, usage, and mechanics without attempts to correct them

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SCORE OF 5

A freewrite in this category demonstrates *reasonably consistent mastery of freewriting*, although it will have occasional lapses in structure and resemble an essay.

- effectively develops ideas on the issue with some unnecessary tangents
- demonstrates strong critical thinking, generally using appropriate examples, reasons, and other evidence to support ideas
- is somewhat organized and focused, demonstrating more frequent coherence and some progression of ideas
- lacks most punctuation and connectives, using appropriate vocabulary
- demonstrates variety in sentence structure when sentences are used
- has many errors in grammar, usage, and mechanics with only a few attempts to correct them.

SCORE OF 4

A freewrite in this category demonstrates *adequate mastery freewriting*, although it will have lapses in quality and will have sections that resemble an essay

- develops ideas on the issue and demonstrates competent critical thinking, using adequate examples, reasons, and other evidence as support for ideas
- has sections that are generally organized and focused,
- demonstrating some coherence and progression of ideas
- general knowledge vocabulary used, very little variation.
- demonstrates some variety in sentence structure
- has some errors in grammar, usage, and mechanics with a moderate number of corrections

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SCORE OF 3

A freewrite in this category demonstrates *developing mastery.* These freewrites are characterized by ONE OR MORE of the following weaknesses:

- develops a point of view on the issue, demonstrating some critical thinking, but may do so inconsistently or use inadequate examples, reasons, or other evidence to support ideas.
- uses some organization and there is some focus on writing in an essay format. There are some lapses in coherence or progression of ideas freely
- sometimes uses weak vocabulary or inappropriate word choice
- lacks variety in sentence structure when sentences are used
- contains an accumulation of errors in grammar, usage, and mechanics with attempts to correct them.

SCORE OF 2

A freewrite in this category demonstrates *little mastery of freewriting.* Characterized by ONE OR MORE of the following weaknesses:

- develops a point of view on the issue that is vague or seriously limited, and demonstrates weak critical thinking, providing inappropriate or insufficient examples, reasons, or other evidence to support ideas
- is organized and/or focused like an essay
- very limited vocabulary or incorrect word choice
- contains errors in grammar, usage, and mechanics so serious that meaning is somewhat obscured with attempts to change the errors that are noticed by the writer

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SCORE OF 1

A freewrite of this score resembles a poor quality finished essay.

- develops no viable point of view on the issue, or provides little or no evidence to support its ideas
- Structured into a basic essay format.
- is disorganized or unfocused, but resulting in a disjointed or incoherent essay
- Ideas are fully formed and no loose ends are left.
- little variation in sentence structure
- Contains pervasive errors in grammar, usage, or mechanics that persistently interfere with meaning within a normal essay format.
- Whenever a known error is made a correction is made

Freewrites not written on the prompt or that continually repeat I don't know what to say or have excessive strings of profanity will receive a score of zero.

Appendix G
SAT Essay Rubric

1. *Score of 6*

   An essay in this category demonstrates clear and consistent mastery, although it may have a few minor errors. A typical essay:

- Effectively and insightfully develops a point of view on the issue and demonstrates outstanding critical thinking, using clearly appropriate examples, reasons and other evidence to support its position
- Is well organized and clearly focused, demonstrating clear coherence and smooth progression of ideas
- Exhibits skillful use of language, using a varied, accurate and apt vocabulary
- Demonstrates meaningful variety in sentence structure
- Is free of most errors in grammar, usage and mechanics

2. *Score of 5*

   An essay in this category demonstrates reasonably consistent mastery, although it has occasional errors or lapses in quality. A typical essay:

- Effectively develops a point of view on the issue and demonstrates strong critical thinking, generally using appropriate examples, reasons and other evidence to support its position
- Is well organized and focused, demonstrating coherence and progression of ideas
- Exhibits facility in the use of language, using appropriate vocabulary
- Demonstrates variety in sentence structure
- Is generally free of most errors in grammar, usage and mechanics

3. *Score of 4*

   An essay in this category demonstrates adequate mastery, although it has lapses in quality. A typical essay:

- Develops a point of view on the issue and demonstrates competent critical thinking, using adequate examples, reasons and other evidence to support its position
- Is generally organized and focused, demonstrating some coherence and progression of ideas
- Exhibits adequate but inconsistent facility in the use of language, using generally appropriate vocabulary
- Demonstrates some variety in sentence structure
- Has some errors in grammar, usage and mechanics

4. *Score of 3*

An essay in this category demonstrates developing mastery, and is marked by ONE OR MORE of the following weaknesses:

- Develops a point of view on the issue, demonstrating some critical thinking, but may do so inconsistently or use inadequate examples, reasons or other evidence to support its position
- Is limited in its organization or focus, or may demonstrate some lapses in coherence or progression of ideas
- Displays developing facility in the use of language, but sometimes uses weak vocabulary or inappropriate word choice
- Lacks variety or demonstrates problems in sentence structure
- Contains an accumulation of errors in grammar, usage and mechanics

5. *Score of 2*

   An essay in this category demonstrates little mastery, and is flawed by ONE OR MORE of the following weaknesses:

- Develops a point of view on the issue that is vague or seriously limited, and demonstrates weak critical thinking, providing inappropriate or insufficient examples, reasons or other evidence to support its position
- Is poorly organized and/or focused, or demonstrates serious problems with coherence or progression of ideas
- Displays very little facility in the use of language, using very limited vocabulary or incorrect word choice
- Demonstrates frequent problems in sentence structure
- Contains errors in grammar, usage and mechanics so serious that meaning is somewhat obscured

6. *Score of 1*

   An essay in this category demonstrates very little or no mastery, and is severely flawed by ONE OR MORE of the following weaknesses:

- Develops no viable point of view on the issue, or provides little or no evidence to support its position
- Is disorganized or unfocused, resulting in a disjointed or incoherent essay
- Displays fundamental errors in vocabulary
- Demonstrates severe flaws in sentence structure
- Contains pervasive errors in grammar, usage or mechanics that persistently interfere with meaning

7. *Score of 0*

   Essays not written on the essay assignment will receive a score of zero

Appendix H
WASSI-2 with scale labels

Read the following items and circle the response that best represents your recent writing experiences.
Use the following scale:

1 = Strongly disagree 2 = Moderately disagree 3 = Slightly disagree
4 = Slightly agree 5= Moderately agree 6 = Strongly agree

1. N RR It seems unnecessary to review my papers carefully before submitting them.
2. SE When I write a book report, I think it will be one of the best in my class.
3. N PRE-B I feel that thinking about what I need to write is a waste of time.
4. N AT I do not like to write research papers.
5. IC I repeat my thesis in the conclusion section of my papers.
6. AT I enjoy writing.
7. PRE-B I come up with more ideas than I need for a paper.
8. N COH I do not make sure that my sentences have overlapping words.
9. N IC I do not use a thesis statement in my opening paragraph.
10. N PRE-P I do not consider what goals I want to achieve before I start writing.
11. N PRE-B I cannot think of good ideas to include in a paper.
12. PRE-P I develop an outline reflecting the order of what I am going to say before I start writing.
13. N COH I do not choose words carefully to maintain links with earlier parts of my paper.
14. SE When I encounter problems while writing, I do not quit.
15. N AT I avoid writing whenever I can.
16. SE I am confident that I can express my ideas well in writing.
17. N AT I do not like to write about my experiences.
18. N SE I am not confident in my ability to write.
19. IC I include important points in the first paragraph of my papers.
20. N IC I do not feel that a conclusion to a paper is necessary.
21. SE When I write a research paper, I think it will be one of the best in my class.
22. N COH I do not ensure that my arguments make sense to others.
23. RR I review my papers to ensure that they meet the requirements of the assignment.
24. PRE-B I develop lists of varied ideas to include in a paper.
25. IC I repeat my most important arguments at the end of my papers.
26. N COH I do not link together sentences that have similar topics.
27. N IC I do not include conclusion sections in my papers.
28. N SE When I write a short essay, I think it will be one of the worst in my class.
29. N IC I do not include an introduction in my papers.
30. N RR I change only errors that my teacher or a peer reviewer has identified.
31. PRE-B I consider many ideas before I start writing a paper.
32. COH I make sure what the meaning of pronouns, such as he, she, this, and that, are clear.
33. IC I write conclusions that effectively pull all my thoughts together.
34. PRE-B I write down every idea that could be included in it before I start writing a paper.
35. N PRE-B I cannot think of many ideas that meet the requirements of the assignment.
36. N PRE-P I do not have an organized plan for my paper before I start writing.

37. COH I organize information into well-sequenced paragraphs that fit together.
38. N RR I do not review my papers to ensure that I have supported my claims with good evidence.
39. PRE-P I have a plan for how my paper will be organized when I start writing a paper.
40. N RR I do not review my papers to ensure that I have addressed opposing claims.
41. COH I write sentences that connect together well.
42. N AT Writing is not an activity I enjoy.
43. N PRE-P I do not map ideas to help organize my paper before I start writing.
44. RR When a mistake is identified in my paper, I fix that problem and other similar ones.
45. SE When I write a paper, I think it will be better than other papers in my class.
46. N SE I quit writing when it is too difficult.
47. AT I like to write short essays.
48. RR I revise my papers at least once.
49. PRE-B I start writing down ideas immediately after I read the assignment.
50. N PRE-B I do not create lists of ideas to include in a paper.
51. PRE-P I think about the best ways to meet the requirements of the assignment before I start writing.
52. N PRE-P I do not develop an outline before I start writing.
53. COH I write sentences so that they are ordered in logical sequences.
54. IC I write introductions to attract the attention of readers.
55. N COH I do not connect my sentences with words such as although, however, and whereas.
56. AT I like to write about my thoughts and feelings.
57. N IC I do not feel that an introduction to a paper is necessary.
58. RR I revise my sentences and paragraphs while I am writing.
59. N PRE-B I do not make notes before I start writing a paper.
60. PRE-P I develop a plan for achieving my goals before I start writing.
61. N PRE-P I do not develop a writing plan before I start writing.
62. N SE When I write an argument paper, I think it will be one of the worst in my class.
63. N SE I lack confidence in my writing skills.
64. AT I like to write book reports.
65. PRE-P I try to see how all of my ideas are related before I start writing.
66. N RR I do not revise my sentences while I am writing.
67. COH I choose words carefully to maintain a clear focus across my paper.
68. N AT Writing is a waste of time.
69. AT I like writing papers where I make an argument.
70. RR I proofread my papers.

Appendix I

High School Survey Packet

You will be asked to answer a variety of items focusing on both your experience of writing as well as you and your personality. It is important for you to answer these questions honestly and to complete each item.

1. Read the following items and select the response that best represents your recent writing experiences.

Use the following scale:

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
It seems unnecessary to review my papers carefully before submitting them.	○	○	○	○	○	○
When I write a book report, I think it will be one of the best in my class.	○	○	○	○	○	○
I feel that thinking about what I need to write is a waste of time.	○	○	○	○	○	○
I do not like to write research papers.	○	○	○	○	○	○
I repeat my thesis in the conclusion section of my papers.	○	○	○	○	○	○
I enjoy writing.	○	○	○	○	○	○
I come up with more ideas than I need for a paper.	○	○	○	○	○	○
I do not make sure that my sentences have overlapping words.	○	○	○	○	○	○
I do not use a thesis statement in my opening paragraph.	○	○	○	○	○	○
I do not consider what goals I want to achieve before I start writing.	○	○	○	○	○	○

2. Read the following items and select the response that best represents your recent writing experiences.

Use the following scale:

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
I cannot think of good ideas to include in a paper.	○	○	○	○	○	○
I develop an outline reflecting the order of what I am going to say before I start writing.	○	○	○	○	○	○
I do not choose words carefully to maintain links with earlier parts of my paper.	○	○	○	○	○	○
When I encounter problems while writing, I do not quit.	○	○	○	○	○	○
I avoid writing whenever I can.	○	○	○	○	○	○
I am confident that I can express my ideas well in writing.	○	○	○	○	○	○
I do not like to write about my experiences.	○	○	○	○	○	○
I am not confident in my ability to write.	○	○	○	○	○	○
I include important points in the first paragraph of my papers.	○	○	○	○	○	○
I do not feel that a conclusion to a paper is necessary.	○	○	○	○	○	○

3. Read the following items and select the response that best represents your recent writing experiences.

Use the following scale:

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
When I write a research paper, I think it will be one of the best in my class.	◯	◯	◯	◯	◯	◯
I do not ensure that my arguments make sense to others.	◯	◯	◯	◯	◯	◯
I review my papers to ensure that they meet the requirements of the assignment.	◯	◯	◯	◯	◯	◯
I develop lists of varied ideas to include in a paper.	◯	◯	◯	◯	◯	◯
I repeat my most important arguments at the end of my papers.	◯	◯	◯	◯	◯	◯
I do not link together sentences that have similar topics.	◯	◯	◯	◯	◯	◯
I do not include conclusion sections in my papers.	◯	◯	◯	◯	◯	◯
When I write a short essay, I think it will be one of the worst in my class.	◯	◯	◯	◯	◯	◯
I do not include an introduction in my papers.	◯	◯	◯	◯	◯	◯
I change only errors that my teacher or a peer reviewer has identified.	◯	◯	◯	◯	◯	◯

4. Read the following items and select the response that best represents your recent writing experiences.

Use the following scale:

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
I consider many ideas before I start writing a paper.	○	○	○	○	○	○
I make sure that the meaning of pronouns, such as he, she, this, and that, are clear.	○	○	○	○	○	○
I write conclusions that effectively pull all my thoughts together.	○	○	○	○	○	○
I write down every idea that could be included in a paper before I start writing it.	○	○	○	○	○	○
I cannot think of many ideas that meet the requirements of the assignment.	○	○	○	○	○	○
I do not have an organized plan for my paper before I start writing.	○	○	○	○	○	○
I organize information into well-sequenced paragraphs that fit together.	○	○	○	○	○	○
I do not review my papers to ensure that I have supported my claims with good evidence.	○	○	○	○	○	○
I have a plan for how my paper will be organized when I start writing a paper.	○	○	○	○	○	○

5. Read the following items and select the response that best represents your recent writing experiences.

Use the following scale:

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
I do not review my papers to ensure that I have addressed opposing claims.	◯	◯	◯	◯	◯	◯
I write sentences that connect together well.	◯	◯	◯	◯	◯	◯
Writing is not an activity I enjoy.	◯	◯	◯	◯	◯	◯
I do not map ideas to help organize my paper before I start writing.	◯	◯	◯	◯	◯	◯
When a mistake is identified in my paper, I fix that problem and other similar ones.	◯	◯	◯	◯	◯	◯
When I write a paper, I think it will be better than other papers in my class.	◯	◯	◯	◯	◯	◯
I quit writing when it is too difficult.	◯	◯	◯	◯	◯	◯
I like to write short essays.	◯	◯	◯	◯	◯	◯
I revise my papers at least once.	◯	◯	◯	◯	◯	◯
I start writing down ideas immediately after I read the assignment.	◯	◯	◯	◯	◯	◯

6. Read the following items and select the response that best represents your recent writing experiences.

Use the following scale:

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
I do not create lists of ideas to include in a paper.	◯	◯	◯	◯	◯	◯
I think about the best ways to meet the requirements of the assignment before I start writing.	◯	◯	◯	◯	◯	◯
I do not develop an outline before I start writing.	◯	◯	◯	◯	◯	◯
I write sentences so that they are ordered in logical sequences.	◯	◯	◯	◯	◯	◯
I write introductions to attract the attention of readers.	◯	◯	◯	◯	◯	◯
I do not connect my sentences with words such as although, however, and whereas.	◯	◯	◯	◯	◯	◯
I like to write about my thoughts and feelings.	◯	◯	◯	◯	◯	◯
I do not feel that an introduction to a paper is necessary.	◯	◯	◯	◯	◯	◯
I revise my sentences and paragraphs while I am writing.	◯	◯	◯	◯	◯	◯
I do not make notes before I start writing a paper.	◯	◯	◯	◯	◯	◯

7. Read the following items and select the response that best represents your recent writing experiences.

Use the following scale:

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
I develop a plan for achieving my goals before I start writing.	◯	◯	◯	◯	◯	◯
I do not develop a writing plan before I start writing.	◯	◯	◯	◯	◯	◯
When I write an argument paper, I think it will be one of the worst in my class.	◯	◯	◯	◯	◯	◯
I lack confidence in my writing skills.	◯	◯	◯	◯	◯	◯
I like to write book reports.	◯	◯	◯	◯	◯	◯
I try to see how all of my ideas are related before I start writing.	◯	◯	◯	◯	◯	◯
I do not revise my sentences while I am writing.	◯	◯	◯	◯	◯	◯
I choose words carefully to maintain a clear focus across my paper.	◯	◯	◯	◯	◯	◯
Writing is a waste of time.	◯	◯	◯	◯	◯	◯
I like writing papers where I make an argument.	◯	◯	◯	◯	◯	◯
I proofread my papers.	◯	◯	◯	◯	◯	◯

Appendix J
Writing Apprehension Test

Here are some more items focusing on your writing. Notice that you must respond to each item using five response options.

There are no correct answers, only give your honest response to each item.
5- Strongly Disagree 4- Disagree 3- Uncertain 2- Agree 1-Strongly Agree

1. I avoid writing.
2. I have no fear of my writing's being evaluated.
3. I look forward to writing down my ideas.
4. I am afraid of writing essays when I know they will be evaluated.
5. Taking a composition course is a very frightening experience.
6. Handing in a composition makes me feel good.
7. My mind seems to go blank when I start to work on my composition.
8. Expressing ideas through writing seems to be a waste of time.
9. I would enjoy submitting my writing to magazines for evaluation and publication.
10. I like to write down my ideas. I feel confident in my ability to express my ideas clearly in writing.
11. I like to have my friends read what I have written.
12. I'm nervous about writing.
13. People seem to enjoy what I write.
14. I enjoy writing.
15. I never seem to be able to write down my ideas clearly.
16. Writing is a lot of fun.
17. I expect to do poorly in composition classes even before I enter them.
18. I like seeing my thoughts on paper.
19. Discussing my writing with others is enjoyable. I have a terrible time organizing my ideas in a composition course.
20. When I hand in a composition, I know I'm going to do poorly.
21. It's easy for me to write good compositions.
22. I don't think I write as well as most other people.
23. I don't like my compositions to be evaluated.
24. I'm not good at writing.

Appendix K
Children's Social Desirability Scale

This questionnaire lists a number of experiences that most children have at one time or another. Read each of these carefully. After you have read one, decide whether it does or does not fit you. If it does, put a T (for true) in front of the statement; if it doesn't, put an F (for false) in front of the statement.

1. I always enjoy myself at a party.
2. I tell a little lie sometimes.
3. I never get angry if I have to stop in the middle of something I'm doing to eat dinner, or go to school.
4. Sometimes I don't like to share my things with my friends.
5. I am always respectful of older people.
6. I would never hit a boy or girl who was smaller than me.
7. Sometimes I do not feel like doing what my teachers want me to do.
8. I never act "fresh" or "talk back" to my mother or father.
9. When I make a mistake, I always admit I am wrong.
10. I feel my parents do not always show good judgment.
11. I have never felt like saying unkind things to a person.
12. I always finish all of my homework on time.
13. Sometimes I have felt like throwing or breaking things.
14. I never let someone else get blamed for what I did wrong.
15. Sometimes I say something just to impress my friends.
16. I am always careful about keeping my clothing neat, and my room picked up.
17. I never shout when I feel angry.
18. Sometimes I feel like staying home from school even if I am not sick.
19. Sometimes I wish that my parents didn't check up on me so closely.
20. I always help people who need help.
21. Sometimes I argue with my mother to do something she doesn't want me to do.
22. I never say anything that would make a person feel bad.
23. My teachers always know more about everything than I do.
24. I am always polite, even to people who are not very nice.
25. Sometimes I do things I've been told not to do.
26. I never get angry.
27. I sometimes want to own things just because my friends have them.
28. I always listen to my parents.
29. I never forget to say "please" and "thank you."
30. Sometimes I wish I could just "mess around" instead of having to go to school.
31. I always wash my hands before every meal.
32. Sometimes I dislike helping my parents even though I know they need my help around the house.
33. I never find it hard to make friends.
34. I have never been tempted to break a rule or a law.
35. Sometimes I try to get even when someone does something to me I don't like.
36. I sometimes feel angry when I don't get my way.
37. I always help an injured animal.
38. Sometimes I want to do things my parents think I am too young to do.
39. I sometimes feel like making fun of other people.
40. I have never borrowed anything without asking permission first.
41. Sometimes I get annoyed when someone disturbs something I've been working on.
42. I am always glad to cooperate with others.
43. I never get annoyed when my best friend wants to do something I don't want to do.
44. Sometimes I wish that the other kids would pay more attention to what I say.
45. I always do the right things.

46. Sometimes I don't like to obey my parents.
47. Sometimes I don't like it when another person asks me to do things for him.
48. Sometimes I get mad when people don't do what I want.

Appendix N
Informed Consent

October 8, 2009

Dear Parents/Guardians:

My colleagues and I at the University of Memphis are currently conducting a project at your adolescent's high school regarding writing composition. This is a very important study that has been provided funding from the Institute for Education Sciences, and it is expected to contribute greatly to educators' ability to improve adolescents' advanced writing skills. Your adolescent's English/Language Arts teacher has graciously volunteered to participate in our project. We are writing to assure you that this study was reviewed and approved by the University of Memphis Institutional Review Board and the Memphis City Schools Office of Research and Evaluation. All of the activities in which your adolescent may participate will be normal educational activities similar to those your adolescent encounters in his or her classroom. Moreover, it is expected that your adolescent will benefit from participating in our research because the study concerns strategies associated with more effective writing composition. We also assure you that all information regarding your adolescent will be kept confidential.

More information regarding this study is provided on back of this letter. If you have any further questions, please contact me or your adolescent's teacher. If you do not wish for your adolescent to participate in the study, please sign and return this form. If you agree that your adolescent may participate in activities related to the study, please keep this form for your future reference (you do not need to return the form if you agree that your adolescent may participate).

Sincerely,

Dr. Danielle S. McNamara
Professor

University of Memphis
Psychology Department, Rm. 434
Memphis, TN 38152
Email: d.mcnamara@mail.psyc.memphis.edu
Phone: 901-678-2326

TITLE OF THE RESEARCH
An Automated Tutoring System that Provides Interactive Writing Strategy Training

INVITATION TO PARTICIPATE
You are invited to permit your adolescent to participate in this project designed to improve high school students' writing composition

BASIS FOR SELECTION
Adolescents in your adolescent's school have been invited to participate in this study.

PURPOSE OF THE STUDY
The purpose of the study is to aid in the building of an automated writing tutor.

EXPLANATION OF PROCEDURE
If you agree to participate, your adolescent will complete a series of brief tasks assessing writing strategy use and a writing sample.

POTENTIAL BENEFITS
The information gathered in this project will be used to assess the usefulness of computer software designed to help students' improve their writing composition and whether it can be successfully integrated into high schools.

POTENTIAL RISKS
Adolescents will be at minimal risk of psychological or physical discomfort or harm during the completion of this research. All students will be asked to complete a series of tasks at their school. An adult will be present at all times. Participation in this study will not impact the services or education your adolescent receives at school. As required by the university review board, note that The University of Memphis does not have any funds budgeted for compensation for injury, damages, or other expenses.

ASSURANCE OF CONFIDENTIALITY
All information obtained in this study that could identify you or your adolescent will be kept confidential within the limits allowed by law. The information will be kept in a locked filing cabinet and in secure computer files. The specific results of your adolescent's participation will not be provided to you or to any other persons or institutions. The information obtained in this study may be published in scientific journals or presented at scientific meetings, but your adolescent's name and identity will never be included with this information.

WITHDRAWAL FROM STUDY
Participation in this study is voluntary. If you decide to allow your adolescent to participate, you are free to withdraw your adolescent from the study at any time.

OFFER TO ANSWER QUESTIONS
If you have any questions about this project, please do not hesitate to contact the principal investigator, Dr. Danielle S. McNamara at (901) 678-2326. If you have questions concerning your rights or the rights of your adolescent as a research participant, you may contact the Chair of the Committee for the Protection of Human Research Participants at (901) 678-2533. If you do not wish your adolescent to participate in this study, please return this form to your adolescent's teacher. If you agree that your adolescent may participate, please keep this form for your records. If the form is not returned it is assumed that you are willing for your adolescent to take part.

I do not wish my adolescent to participate

_____ _____
Signature of Parent or Guardian Date