Epistemological and writing beliefs in a first-year college writing course: Exploring shifts across a semester and relationships with argument quality

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Abstract: This study examined 164 freshman undergraduates' epistemological and writing beliefs, and rhetorical writing performance, in a first-year writing course. Students completed epistemological and writing belief scales early and late in the semester. In addition, their end of semester rhetorical writing assignment was collected. Correlational analyses indicated significant relationships between students' epistemological and writing beliefs across a 16-week semester. Results of MANOVA show a significant shift in students' epistemological beliefs regarding fast learning and certain knowledge across the semester, as well as significant changes in their view of writing as a product and writing's purpose to avoid disagreement. Correlational analyses link students' writing beliefs to their rhetorical writing performance. The study includes a discussion of qualitative features of students' writing relative to their writing beliefs.

Keywords: Knowledge beliefs, task-specific beliefs, freshman composition, rhetorical writing, persuasive writing, audience awareness

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As students progress through college, their ideas change about many things, including what they think about the nature of learning and knowledge. When all goes well, college students undergo a tremendous perspective-shift over the course of their academic careers, as studies of epistemological beliefs have indicated (e.g. Magolda, 2001; Hofer & Pintrich, 1997; Kuhn, Cheney, & Weinstock, 2000; Perry, 1970; Schommer, 1993). In addition to shifting beliefs about knowledge and learning, students' beliefs about academic tasks, such as research and writing (Berkenkotter, Huckin, & Ackerman, 1991; Curtis & Herrington, 2003; Haas, 1994; Haswell, 2000), may also change. The goal of the current study was to explore the relationship between more general epistemological beliefs and those of writing (Schraw, 2013) and to understand whether epistemological and writing beliefs relate to students' rhetorical writing performance.

As first year writing instruction, particularly in the US (Lunsford, Wilson, & Eberly, 2009), has shifted to include a rhetorical approach to writing (e.g. Berlin, 1985; Lunsford & Glenn, 1990; Crowley, 1998), the type of writing that students are assigned in many first-year undergraduate composition courses emphasizes rhetorical situation, audience awareness, consideration of alternative perspectives via counterargument and rebuttal, and writing as a way to construct meaning for audience and writing (Bartholomae 1986; Elbow 1991). As such, rhetorical writing tasks have resonance with the concept of epistemological beliefs because such writing requires the writer to consider alternative perspectives, a key aspect of so-called epistemological "sophistication." Further, these first-year undergraduate composition courses emphasize a process model of writing and texts as active components within larger conversations (McMillen & Hill, 2004), with the goal to shift students' views away from product-based writing and texts as static entities (Yancey, 2001).

This study explored the connection between freshmen students' beliefs and their rhetorical writing by first examining the relationship between knowledge and writing beliefs, then measuring the changes in students' epistemological and writing beliefs across the course of a semester. Next, students' final course papers, a rhetorical writing assignment, were scored and correlated with their knowledge and writing beliefs. Finally, qualitative features of students' writing, relative to their writing beliefs, were explored.

1. Theoretical Framework

Prior studies have explored individuals' beliefs about knowledge and learning, epistemological beliefs, and task specific beliefs such as writing and reading. Taken together, this work suggests that epistemological growth can occur across the students' college careers and that some epistemological and task beliefs may be related to academic task performance, such as writing.

1.1 Epistemological Beliefs

Educational psychologists since Perry (1970) have noted that college students undergo a transformation, moving away from a dichotomous (right vs. wrong) absolutist view of knowledge toward a consideration of multiple perspectives. Although college likely does not have a monopoly on epistemological growth, research supports its distinct contribution toward students' epistemological shifts. Many researchers have investigated this shift using structured, open-ended interviews with students (Magolda, 2001; King & Kitchener, 1994). Through semi-structured, longitudinal interviews with students, these studies have identified a trend in the way their views of knowledge and knowing evolve over time. The nature of the interview measures necessitated time, long-term access to participants, and complex scoring techniques in order to assess potential shifts in students' beliefs.

The Epistemological Belief Questionnaire, composed by Schommer (1990; Schommer-Akins, 2004), represents an important development in epistemological belief research because it is a pencil-and-paper measure of the phenomenon previously assessed via interviews. Research using this scale in academic settings has reported a positive relationship between more constructed, contingent views of knowledge and education level (Schommer, 1998). Belief in quick learning has also predicted lower GPAs in college students, lower reading comprehension, and over-estimates of comprehension levels (Schommer, 1990; 1993).

Studies of epistemological beliefs in non-undergraduate populations also illustrate links between individuals' beliefs and their performance and further suggest that beliefs are mutable given certain circumstances. For example, studies of epistemological beliefs using Schommer's measure include those of preservice teachers (e.g., Brownlee, Walker, Lennox, Exley, & Pearce, 2009; Cheng, Chan, Tang, & Cheng, 2009; Jena & Ahmad, 2013) and inservice teachers across multiple grade and university levels (e.g., Fives & Buehl, 2008; Hillocks, 1999; Maggioni & Parkinson, 2008). In general, these studies showed that teachers' beliefs about knowing relate to their beliefs about learning, and that these epistemological beliefs relate to instructional decisions, thus suggesting that these beliefs inform behaviors.

1.2 Task-specific beliefs

Findings from a number of empirical studies suggested that students hold beliefs about specific academic tasks. One such study, conducted by Schraw (2000), used the Reading Beliefs Inventory (RBI) to assess students' understanding of reading as either primarily a transmissional activity or a transactional activity. Individuals high on the transmission subscale of the RBI held beliefs that emphasized comprehension and accessing of the author's intended meaning, whereas transaction beliefs referred to those that emphasize the building of meaning from text. Findings with the RBI suggest that the type of reading beliefs undergraduates held were related to the quality of their writing as illustrated in paragraphs, which students composed as part of the study

prompt. Readers with high transactional and low transmissional beliefs tended to write significantly longer and more critical responses to the reading passage they were given.

Similar findings using the Writing Beliefs Inventory (White and Bruning, 2005) showed that writing beliefs, in addition to reading beliefs, contributed significantly to the quality of students' writing as well as their level engagement in the task. Participants who held highly transactional views of writing, reflecting a view of writing as a communicative versus demonstrative act, also reported feeling higher levels of efficacy regarding writing (Shell, Colvin, & Bruning, 1995). Their analyses also indicated that students may simultaneously hold high transmissional and high transactional beliefs about writing, but those that hold only high transmissional beliefs (and low transactional ones) "may approach writing tasks in ways that circumvent integration of critical content and personal ideas when generating text." (p.182).

1.3 Beliefs and Academic Task Performance

In studies linking epistemological beliefs to students' performance on a writing task (Kardash & Scholes, 1996; Mason & Boscolo, 2004; Schommer, 1993b), aspects of students' epistemological beliefs were found to predict their performance on a paragraph-writing task. Kardash and Scholes (1996) found that undergraduates' beliefs about certain knowledge, together with need for cognition and prior beliefs about the topic, predicted the quality of concluding paragraphs. Another study of college students (Schommer, 1993b) echoed the link between students' epistemological beliefs and performance on a concluding paragraph-writing task. These findings suggested that beliefs in quick learning and certain knowledge were related to students' writing oversimplified concluding paragraphs. Further, Mason and Scirica (2006) found epistemological beliefs predicted the argument skills of eighth-grade students asked to generate counteraguments and rebuttals about a controversial reading.

Additional work by Mateos, Cuevas, Martin, Martin, Echeita, and Luna (2011) explored relationships between university students' reading, writing, and epistemological beliefs relative to their performance on an argumentative writing task. Writing was assessed via short synthesis essays, about controversial readings, that students wrote as part of the study. In correlational analyses, they found that transactional reading beliefs were the only significant predictor of the extent to which students represented alternative perspectives, or "perspectivsim," in these essays. While the link between reading beliefs and writing features was significant, they did not find a significant relationship between writing or epistemological beliefs and writing performance.

These studies linking epistemological and task beliefs to argumentative writing, via a paragraph writing task, suggest a significant relationship between beliefs and rhetorical-type writing. A study involving different data on student writing, longer pieces of course-based writing, also highlights a potential link between beliefs and argumentative writing. Researchers (Hays, Brandt, and Chantry, 1988; Hays & Brandt, 1992) evaluated student papers for rhetorical quality and evidence of students'

epistemological stance. Their qualitative analysis supported strong relationships between undergraduates' epistemological beliefs and the quality of their essays, with students holding more constructivist epistemologies writing essays of higher rhetorical quality and evidencing alternative perspectives. In this case, a separate measure of epistemological beliefs was not used but instead was coded from the same data source, the students' papers. Although a separate beliefs measure was not included in the study design, their work represents an important line of work that explored beliefs relative to course-based, "in vivo" undergraduate writing assignments that students drafted over time.

1.4 Scope of the Current Study

In order to explore the relationship between epistemological beliefs, writing beliefs, and course-based rhetorical writing, the following questions were addressed in this study:

Part One

- To what extent, if any, are students' beliefs about knowledge related to their beliefs about writing? Do the relationships between epistemological and writing beliefs change from the beginning to end of a semester?
- Do students' knowledge and writing beliefs change significantly across the semester?

Part Two

- Are students' epistemological beliefs, writing beliefs, and rhetorical writing performance related?

Part Three

- What are qualitative features of papers written by students who have different writing beliefs?

2. Part One - Students' Epistemological and Writing Beliefs across First-year Composition

The purpose of the first part of this study was to track students' epistemological and writing beliefs across the span of a semester-long, lower-division undergraduate rhetoric and writing course (Writ 101). My hypothesis was that students' general epistemological beliefs would not shift over the 14-week period, as measurable epistemic shifts that have been reported seem to require a greater span of years (Jehng, Johnson, & Anderson, 1993; King and Kitchener, 1994; Kuhn, Cheney, & Weinstock, 2000; Pirttilä-Backman & Kajanne, 2001). However, I did expect that their task-specific beliefs about writing would change over the course of the semester due to the nature of rhetorical writing instruction and course outcomes (Yancey, 2001).

2.1 Method

Setting and participants.

Data came from 164 freshmen enrolled across 13 sections of the same lower-division writing course at a large research university in the South. The course was taught by doctoral students in English, Rhetoric, and American Studies departments who had at least 4 semesters of Teaching Assistant experience in related courses. Writ 101 had a uniform syllabus, text, and assignments. Of the freshmen participants in the course during this particular fall semester, 44% were female, 56% were male, and 95% reported ages between 18-19 years. The ethnic breakdown across the sections was as follows: 7% African-American or Black, 16% Asian or Asian-American, 30% Lation/a or Mexican-American, 45% White or Caucasian, and 2% Middle Eastern.

Of this group of freshmen, 35% of the students were Liberal Arts majors, 15% majored in Natural Sciences, 13% in Engineering, 10% in Business, 11% in Fine Arts, 9% in Education, and 5% in Communications. Most of the students, about 80%, were native English speakers, and 84% reported living in the U.S. for their entire lives, with another 10% having lived in the U.S. for more than 4 years. In order to gain admission to the class, international students whose native language was not English were required to take the TOEFL exam, and to achieve a score that indicated a level of English language proficiency adequate for regular college studies.

This course, informed by rhetorical theory and a process view of writing, revising, and argument-building, was designed to help students learn to read and write argumentative essays and explore issues through stasis theory, as presented in the required textbook for the course, *Everything's an Argument* (Lunsford, Ruszkiewicz, & Walters, 2010).

The outcomes for the course include students' development of critical thought, reasoned argument, and audience awareness. As part of the university's required curriculum, students must either take this course or earn credit by testing out of it.

2.2 Data sources

Epistemological Beliefs Questionnaire

Epistemological beliefs were measured using a 63-item scale from Schommer (1990; Schommer-Akins 2004; Schommer-Akins & Hutter, 2002). Items assessed beliefs about the speed of learning, structure of knowledge, whether the ability to learn is fixed, and the stability of knowledge. Each item was rated on a 1-5 scale, with a high score indicating that the individual viewed knowledge and the ability to learn as fixed characteristics and that learning is a quick process.

Schommer's instrument has been critiqued for its psychometric properties and for the analyses used in order to identify subscales (Schraw, Bendixen, & Dunkle, 2002; Wood & Kardash, 2002). When Schommer created the questionnaire, she gave its 63 items to a group of educational psychologists and asked them to categorize each item into subsets. The result was twelve categories ranging from 2-8 items each. Factor

analysis of the 12 subsets yielded four orthogonal epistemological factors, a structure that has been replicated across multiple studies (Hofer & Pintrich, 1997; Jehng, Johnson, & Anderson 1991; Schommer, 1990, 1993; Schommer & Dunnell, 1992; Schommer, Crouse, & Rhodes, 1992). The categorization of items prior to conducting factor analysis has resulted in critique from other researchers (DeBacker, Crowson, Beesley, Thoma, & Hestevold, 2008; Wood & Kardash, 2002; Wood, Kitchener, & Jensen, 2002), who claimed that this step jeopardizes the validity of the scale. Subsequent researchers who have used the EBQ and Schommer's 12 *a priori* item categories have found similar 4- or 5-factor solutions in their analyses, all using principal axis factoring with Varimax rotation. However, no researcher has replicated the initial step of item categorization by experts.

As a result of the issues, I decided to follow the widely used analysis that involved examining the factor structure of the 12 subcategories. The result was a 4-factor structure for both early and late administrations of the scale, which accounted for 55% of early and 53% of the variance late in the semester, and yielded loading patterns similar for both administrations as well as other studies using the EBQ. Item loadings for the 12 subcategories are presented in Appendix A.

Reliability coefficients (Cronbach's alpha) for each of the four subscales were: Fast Learning (.67 early, .67 late); Authority (.75, .73); Certain Knowledge (.72, .74); Impatience (.63, .65) Overall reliabilities for the measure were .85 on the early administration and .81 for later in the semester.

Writing Beliefs Inventory

This 11-item questionnaire was a revision of White and Bruning's (2001) measure, which was constructed to gauge individuals' beliefs about the purpose of writing. Using 5-point Likert-type scale items, the measure asked respondents to indicate their level of agreement, with 1= strongly disagree and 5= strongly agree. A high score indicated a product-focused view of writing and the belief that writing should be based on the ideas of authorities.

After pilot testing the original WBI with approximately 150 rhetoric and writing students during the previous semester, I found that the initial results did not replicate the two-factor structure presented in earlier work (White & Bruning, 2001; 2005; Mateos et al., 2011) To address the lack of consistent factor loadings, I modified the scale to include items that assessed beliefs relevant to rhetorical writing. I modified items based on class discussions I had with my students and by consulting three veteran rhetoric and writing instructors. The original White and Bruning (2005) scale, along with these additional items, are presented in Appendix B. I administered this revised measure and then analyzed the modified writing beliefs inventory by conducting principal component analysis with an oblique rotation (Varimax). The scree plot indicated a three-factor solution, so I reran the analysis to extract three factors. I dropped one item that was cross-loading ("A primary goal of writing should be to have

to make as few changes as possible"). Reliability coefficients for the 3 extracted factors ranged from .70 to .75, with an overall Cronbach's alpha of .71. Factor loadings for both the early and late semester administration of the writing beliefs inventory are presented in the Appendix B.

Reliability coefficients (Cronbach's alpha) for each of the three subscales were: Writing as a product (.72 early, .70 late); Writing as authority-based (.79, .75); Writing should avoid disagreement (.78, .74). Overall reliabilities for the measure were .85 on the early administration and .81 for later in the semester.

During the third week of a 16-week semester, I visited each of the 13 participating sections of Writ 101, explained the study procedures, reviewed informed consent, and administered the initial survey. These visits took place during class time, but the instructors left the room so they would not know which students had agreed to participate. During week 15 of the semester I returned to administer the survey again, repeating the procedure.

2.3 Results

Relating epistemological and writing beliefs across time.

In order to understand the relationships between epistemological beliefs and writing beliefs, I examined the Pearson correlation coefficients within scales both early and late semester, reported in Table 1. For the subscales of Schommer's Epistemological Beliefs Questionnaire, there were significant relationships among all subscales in both early and late administrations. Writing Beliefs subscales were also all significantly correlated in both early and late semester administrations.

Early in the semester, most of the Writing Belief subscales were significantly correlated with the Epistemological Belief subscales. The view of writing as a product, for instance, was significantly correlated with all of the knowledge belief subscales (.16-.28), indicating that students who view writing as a product were more likely to think that learning happens fast, authority is omniscient, knowledge is certain, and have impatience with ambiguous knowledge. The relationship between early semester EBQ scores and the belief that writing should avoid disagreement was also significant (.18-.29). Finally, students who believed the purpose of writing was to report authorities' ideas also tended to have epistemological beliefs that indicated certain knowing (.13), omniscient authority (.20), and impatience with ambiguous knowledge (.20).

Late in the semester, the view of writing as a product was not significantly related to any of the other subscales. This can be explained by the dramatic shift in students' beliefs about product-focused writing from early to late in the semester, explored in the next section of this study. The relationship between students' belief that writing should avoid disagreement was significantly related to fast learning (.15), omniscient authority (.21), and certain knowledge beliefs (.23), but not to impatience with ambiguous knowledge. Students' belief that the purpose of writing is to report authorities' views remained significantly related to omniscient authority (.30) and certain knowledge

beliefs (.24), but it was no longer related to fast learning and impatience with ambiguous knowledge.

Table 1. Pearson correlations between epistemological belief (ebq) subscales and writing belief scales (wb): time one above, time two below, and stability indexes on diagonal

	EBQ FL	EBQ OA	EBQ CK	EBQ IA	WB WP	WB WRA	WB WAD	
EBQ Fast Learning	-.11	.21*	.12*	.27*	.16*	-.02	.21*	
EBQ Omniscient Authority	.40*	-.19	.25*	.35*	.19*	.20*	.29*	
EBQ Certain Knowledge	.31*	.30*	-.05	.29*	.16*	.13*	.19*	
EQB Impatience with Ambiguity	.70*	.50*	.26*	.03	.28*	.20*	.27*	
WB Writing as Product	.03	.06	. 09	.09	.19	.03	.18*	
WB Writing Report Authority	.11	.30*	.24*	.24*	-.02	.05	.24*	
WB Writing Avoids Disagreement	.15*	.21*	.23*	.23*	.15*	.15*		.09

*$p < .05$

Measuring change in beliefs across the semester.

In order to determine whether students' scores on the epistemological beliefs scale had changed over the course of the semester, I ran a repeated-measures multivariate analysis of variance (MANOVA) on students' early- and late-semester scores on the EBQ and WBI subscales.

Results indicated a significant decrease from early- to late-semester in two of the epistemological belief subscales: Fast Learning ($F(1,163) = 216.86$, $p < .01$) and Certain Knowledge ($F(1, 163) = 165.39$, $p < .01$). Students' scores on other subscales, Authority and Impatience, did not shift significantly across the semester. Means and standard deviations are reported in Table 2.

Recall that high scores on the EBQ reflect a more absolutist epistemology, whereas low scores indicate a view of contingent knowledge, questioning authority, and learning as flexible. With regard to the modified Writing Beliefs Inventory, results indicated a significant shift on two of the subscales: Writing as a Product ($F(1, 163 = 6.80$, $p < .01$) and Writing should Avoid Disagreement ($F(1, 163) = 8.10$, $p < .01$). Recall that a high score indicates a view of writing as a process and that writing should avoid disagreement. Students' beliefs of the product-based nature of writing did change over the semester, with post-test scores indicating a view of writing as communication to an audience and accepting revision as an integral part of the process. Also significant was the change in students' beliefs about disagreement and the value of acknowledging

multiple perspectives in their writing. Late in the semester, students were more likely to report writing to acknowledge disagreements and multiple perspectives.

Table 2. Means, standard deviations, and results of Multivariate analysis of Early and Late EBQ and WBI subscales

Scale	Early *M* *(SD)*	Late *M* *(SD)*	Mean Square	*F*	*p*	Partial η^2
Epistemological Belief Questionnaire						
Fast Learning*	3.9 (.40)	3.3 (.30)	25.23	216.86	.00	.57
Authority	3.0 (.40)	3.0 (.40)	.07	.32	.57	.00
Certain Knowledge*	3.6 (.40)	3.0 (.40)	23.69	165.39	.00	.51
Impatience	3.3 (.40)	3.2 (.40)	.53	2.49	.12	.02
Writing Beliefs Inventory						
Writing as a product*	1.50 (.62)	1.38 (.67)	1.08	6.80	.01	.04
Writing as authority-based	2.65 (.82)	2.64 (.76)	.00	.01	.93	.00
Writing should avoid disagreement*	2.62 (.86)	2.43 (.90)	2.96	8.10	.01	.05

* $p < .01$

Scores reflecting students' ideas about the role authorities' views in their own writing did not change significantly across the course of the semester. The three items on the "Report Authority" scale assessed the extent to which students believe that good writing involves accurately reporting authorities' views and including direct quotations in their papers. Although Writ 101 emphasized students' ownership of knowledge, there was a strong emphasis on source use, correct citation format, and avoiding misrepresenting sources through fallacies such as creating a straw man. It might be the case that stressing citation formats and source use, while important, restricted the students' sense of ownership and appropriation of their writing.

3. Part Two: Exploring the relationship between students' final papers and their epistemological beliefs

The purpose of this part of the study was to explore the relationship between students' epistemological and writing beliefs relative to their rhetorical writing performance. Using a course-based academic task, and not one generated as part of study participation, represents a different approach compared to paragraph-writing tasks in earlier studies (Kardash & Scholes, 1996; Mason & Boscolo, 2004; Mateos et. al, 2011; Schommer, 1990). The students' final course papers were collected to serve as writing performance data, and 81 freshman papers were randomly selected from the larger group, scored, and included in further analysis.

3.1 Method

Data came from the same setting and measures described in Part One, with the addition of the students' final course paper.

Persuasive proposal paper

As the final course assignment, students wrote a 5-to-7-page "Proposal Argument" in which they were to research a problem of their own choosing (citing at least five credible sources) and propose a solution to a particular audience. For example, one student wrote to the head of the university's food division to request healthier dinner options in the dorm cafeteria. The proposal paper was meant to draw on all the rhetorical skills and concepts students had learned during the semester. The Writ 101 curriculum, emphasizing a process model of writing, required that students submit and receive feedback on a draft of their writing at least two weeks prior, then revise and submit a final draft. For the purpose of this study, only the final drafts of the proposal arguments were collected. The 81 freshman papers were scored via a rubric created by Charney (2004) across 10 components, detailed in Table 3.

The pool of raters consisted of 5 instructors, all doctoral students, each of whom had taught the course for at least five semesters. They attended a two-hour norming session about use of the long scoring guide, a document that described the characteristics of each category at each of the 5 levels, an excerpt from which is in Appendix C. Each paper was subjected to blind scoring across the 10 components by two raters, meaning that raters did not have access to identifying information about the student nor knowledge of students' epistemological and writing belief scale scores. Reliability among raters was excellent, ranging from 87-96% agreement within one point. Once inter-rater reliability was calculated, the two scorers' ratings for each component were averaged for use in subsequent analyses.

Table 3. Description of 10 scoring rubric components

Component	Description *To what extent does the writer:*	Mean (SD)
Exigence	Motivate the reader to keep reading? Demonstrate the scope and context of the problem? Take on a clear and arguable position about the position/controversy?	3.68 (1.08)
Audience Awareness	Address a specific audience in an appropriate, persuasive way? Demonstrate awareness of an audience or readers?	2.33 (1.08)
Logic	Make a clear claim and use reasons and evidence to support claims?	3.51 (.97)
Avoid Certitude and Generalizations	Does the writer come across as fair-minded? Does the writer qualify statements and acknowledge uncertainty in the proposal, or come across as narrow-minded?	3.22 (1.24)
Source Integration	Maintain control of the argument while leveraging sources to support it?	3.22 (1.24)
Counterargument	State, acknowledge, consider, and fairly represent the opposition?	2.91 (1.26)
Rebuttal	Respond to opposing arguments in a clear, reasonable way that demonstrates understanding?	2.93 (1.25)
Organization	Organize paragraphs in a readable, follow-able, consistent way that is free of tangents?	3.56 (1.03)
Source Quality	Select references from reputable sources such as the library databases and news sources? (versus general web searches and Wiki)	3.97 (1.08)
Clarity and Word Choice	Use language that is appropriate and clear in a way that makes it easy to follow the writer's ideas?	4.00 (.85)

Data reduction procedures for paper components

Once the papers had been scored and rater reliability deemed acceptable, I conducted factor analysis (Principal Component Analysis; Varimax rotation) of the 10 paper components. The component of Source Quality interfered with a clean grouping of factors, and is arguably separate from the other components in the sense that source quality may be the result of instructors' directions about acceptable sources. Thus I removed "source quality" and re-ran the analysis. The resulting scree plot suggested a two-factor solution, but the components of Exigence, Logic, and Source Interpretation/Integration continued to cross load even after removing them one at a time from the analysis. Thus, I removed these cross-loading factors and identified a two-factor solution that accounted for 73% of variance. I labeled the factor containing audience awareness, avoiding certainty, counterargument, and rebuttal "Contingency" (coefficient alpha=.86) and the second factor, which included organization and word choice, "Clarity" (coefficient alpha=.70) Factor loadings are listed in the Table 4:

Table 4. Factor loadings for paper components

Component	Contingency	Clarity
Audience Awareness	.31	-.10
Avoid Certainty	.33	.14
Counterargument	.40	-.14
Rebuttal	.38	-10
Organization	-.18	.63
Word Choice	-11	.56
Mean (SD)	*3.16 (1.16)*	*3.87 (.90)*

Once the paper components were reduced to two main factors, the means for these two factors were calculated by directly averaging the component ratings that were included in each factor. These paper component means were then correlated with the freshmen students' late semester belief scale scores. The late semester belief scale scores were selected over the early semester ones because the late semester scores were chronologically closer to the time when the students wrote their final papers. That is, students wrote their proposal papers in the final month of the semester, which is closer in time to the late semester scale administration.

Correlations for the two main paper factors and the belief subconstructs are reported in Table 5. The Writing Belief subscales were significantly correlated with the Contingency paper factor in a negative direction. This suggests that students whose beliefs reflected writing as a product, the purpose of writing as to report authority, and the notion that good writing should avoid disagreement wrote papers that were rated lower on the Contingency factor of their course paper. That is, there was a significant relationship between students' writing beliefs and the illustration of contingent knowledge in their writing performance.

Table 5. Correlations between paper components and late-semester belief scores

Belief measure subconstruct	Contingency	Clarity
EBQ Fast Learning	.03	-.15
EBQ Omniscient Authority	-.13	-.18
EBQ Certain Knowledge	-.08	-.11
EQB Impatience with Ambiguity	-.01	-.17
WB Writing as Product	-.35*	-.08
WB Writing Report Authority	-.30*	-.29*
WB Writing Avoids Disagreement	-.32*	-.19

* $p <. 01$

For the paper component of Clarity, which included organization and word choice, the correlation suggests a significant relationship between the belief that writing should report authorities' ideas and clarity of prose. Students whose beliefs indicated that the purpose of writing is to report authorities' ideas tended to have papers that were less clear and organized. The paper components were not significantly correlated with any of the knowledge belief scales.

4. Part Three - Linking writing beliefs to rhetorical writing artifacts

From Part Two of the study, all three of the Writing Beliefs subscales were significantly related to the "Contingency" factor of students' papers, which included audience awareness, avoiding certainty, and quality of counterargument and rebuttal. Students whose writing beliefs reflected a view of writing as a product, writing to report authorities' ideas, and writing to avoid disagreement tended to compose papers of lower quality on this "Contingency" factor. Students who had a more constructive view of writing, understood writing as a means to shape knowledge, and saw writing as an acknowledgement and exploration of disagreement tended to have papers that were stronger with regard to representing contingent knowledge.

The following section presents excerpts from students' final course papers, the proposal argument, as a means to better understand ways that different writing beliefs may manifest in student writing performance. For this qualitative approach, I selected papers from freshmen whose Writing Belief subscale scores were at least one standard deviation above or below the mean. Discussion of these students' papers is organized around to the elements of the "Contingency" paper factor, which includes counterarguments and rebuttals, avoiding certainty, and audience awareness

4.1 Counterargument and Rebuttal

Negotiating counterarguments is an important rhetorical skill because it enhances writers' credibility, portraying them as fair-minded and reasonable. The proposal paper assignment encouraged students to manage opposing views by including counterarguments and rebuttals in their writing. Andrew, a freshman majoring in journalism, wrote a paper that scored well on the "Contingency" factor of the paper scores, (4.21) and had lower scores on the Writing Beliefs subscales, indicating a process (1.25), interactive (1.53) view of writing that is not averse to recognizing disagreement (1.32). His high quality use of counterarguments, with *rebuttals* in italics, are presented below:

> Mr. Hatch and opponents of flag burning need to realize that *in nearly all cases, people simply don't burn the American flag for sport.* Most often, *it's a statement made in great strife,* particularly when the protestor in question feels his or her rights have been infringed on and is in need of some sort of public forum…*Personally, I have no reason to burn the American flag and God willing,*

> *never will feel the need to. But there are those who are often in such dire situations that no other form of expression seems fitting*…Some will argue that the causes fought for in the 18th century were monumentally more important—no one denies that. But it's because we protested the practices of Imperial England that *we are now able to dissent against our own government on important matters*.

In his rebuttal, Andrew conceded that flag burning is an extreme, and arguably offensive, form of protest. He revealed his own disdain for the practice, aligning himself with possible opposition while also explaining the context in which citizens may protest in this way, emphasizing citizens' freedom of expression. The result is a reasonable, credible response to alternative viewpoints.

Paul, another freshman student, had scores on the Writing Beliefs measures that indicated a more product-focused view of writing (2.07) and view that writing's purpose was to report authorities' views (3.64). Paul wrote about child soldiers in Uganda, stringing references and sources with generalizations. Although he provided ample information about the issue, he did not leverage it toward arguing for a course of action beyond a single sentence in which he wrote, "educating children might be the first of several steps the world can take to help end the suffering of the innocent children." A counterargument to this claim might state, "Some may say that educating children, while important, will not provide for their daily safety," which this author did not attempt in his paper. Paul's score on the contingency factor of his paper was 2.25. Like Paul, other students with lower counterargument, rebuttal, and avoiding certainty paper scores seemed to struggle even to state a particular course of action, instead focusing on the history of the problem and what experts say about it. In this way, these students seemed to write themselves into a corner, making it difficult to think of competing claims. By falling into knowledge-telling mode, these students foreclosed on opportunities to even acknowledge opposing viewpoints.

4.2 Avoiding Certainty and generalizations

Cassie, an undeclared Liberal Arts major, wrote a paper that scored low on avoiding certainty and generalizations (1.72) and on the overall contingency factor (2.92). Her writing belief scores indicated a view of writing that avoids disagreement (3.47) and reports authorities' ideas (3.52), views that are reflected in her writing. In her proposal that college admissions officers should lighten their consideration of SAT scores in admission decisions, she made some generalizations that border on offensive. Cassie seemed to struggle to build her own argument by referencing her sources (*italicized*) as she presented conclusions that did not necessary follow from the evidence she cited:

> The types of people against the SAT are those of the lower class, usually minorities. Statistics by the National Center for Education Statistics shows that in 2001, sixty-four percent of black children in their early childhood, the highest out of any race, needed a childcare and educational program because they

> were so poor (Source 1). They are unfortunate and underprivileged at a young age and are not given a proper education in high school to even prepare for such a test. *The reason minorities are underrepresented in many colleges throughout the country is because many of them cannot afford to pay twenty-six dollars to take a college entrance exam (Source 1)…The SAT hurts minorities because the material in the tests is unfairly too advanced and the overall cost for a minority in America to complete an admissions application is too much.*

As she worked to explain the relationships between race, poverty, and educational opportunity, Cassie inappropriately interpreted some of her sources, presenting conclusions that seemed oversimplified and over-generalized.

Students who were successful in avoiding certainty and generalizations presented their ideas, and those of their sources, as likely but not certain. Rachel, a business student, had writing belief scores that suggested a view of writing that recognizes disagreement (1.48) and a process view of writing (1.05). Her paper scores on the avoiding certainty component were high (4.50) with a high score on the contingency factor (3.78). In her paper, she integrated evidence from authority (a scientific study) to support her argument to limit food advertising during children's programming:

> Initially we need to pinpoint the problems with the present-day marketing system in order to resolve the problem in sending out messages to children. The first instance observed is children having too much leisure time when they come home from school. A case study of 700 kids between the ages of 10-15 years old were constructed in order to prove that there is an intense relationship between the amount of TV they watch and the impulse to eat. The results were unanimous stating that the children's weight were selectively high to their food intake while engaging their TV show. *Even though nothing is for certain with statistics, the probable link with TV and food consumption is the food promotions or food advertisements being shown on a children's TV channel* (Source 1)

The tone of Rachel's paper is a sharp contrast from those of David, a biology major, who wrote with more certain language in favor of funding stem-cell research: "*It is obvious* that federal funding for biomedical cloning *is critical*. Without it, I do not believe that *science will ever progress*. This is the *simple fact* of the government supporting scientists in their pursuit of cures." David's scores on the writing belief scales indicating a view that the purpose of writing is to report authorities' ideas (4.16), with a low score on the avoiding certainty paper component (2.0) and paper contingency factor (2.14).

4.3 Appealing to audience

This paper component, also part of the "Contingency" paper factor, assessed the extent to which students directed their papers toward the interests and concerns of a target

audience. With an overall "audience awareness" mean score of 2.33 (1.08) for all 81 freshman papers, many of the papers addressed a vague, general audience despite the standard assignment prompt that emphasized selecting, and appealing to, a specific target audience.

An example of an audience aware proposal came from Ben, who wrote a letter to his public school's superintendent to argue against steroid testing for high school athletes. Ben's scores on the Writing Beliefs scales indicated a process view of writing (1.12) and a valuing of competing perspectives in writing (1.32). His score on the Contingency factor of the proposal argument was very high, at 4.56. His paper was a particularly strong example of an audience aware proposal because he named a specific audience, referenced this audience's interests of feasibility and cost, and referred to shared town knowledge of prior championships and elections, aspects illustrated in the *italicized* portion of his paper below. In doing so, Ben also built rapport and strong ethos with the superintendent and school board:

> Dear Superintendent Webber and School Board members:
>
> I must confess that I had an addiction in high school. I was addicted to extracurricular activities and excelling in all areas of academia. In my four years at Laughton High School, I participated in one-act play, UIL number sense, chemistry, and team math, tennis, soccer, track, cross country, and band! I am very proud to mention that we were 2-time state champions in cross country and runner-up the other 2 years alternating. That's quite a feat! We had a team of 20 guys and none of us used steroids. If we needed more muscle we were in the weight room. Why would we use drugs to jeopardize our chance of a state title? I ask you, Dr. Webber, what is the probable cause for testing students in Central Independent School District?...I only ask that you, and the Board Members, look before you leap...steroid testing costs $100 per test (Source 1). I find this quite interesting if we turn to our own school district. Where are we going to find the money to fund this program? We are already struggling with the budget due to a brand new elementary school we built last year. Don't expect the town to fund the drug tests, either. Where is that brand new performance art center? Oh, yeah. The town voted against it even though the government was paying for it!

However, even when students addressed an audience and topic familiar to their own background, it was not necessarily rhetorically effective or high scoring. For instance Gabe, a freshman engineering student, also wrote to his superintendent and made direct reference to this audience in the *italicized* sections of his paper below. Gabe's scores on the Writing Belief scales indicated a product-focused view (2.11) and writing to report authorities' ideas (3.52). His score on the "Contingency" factor of his proposal were lower (2.51).

> To: Superintendent Herrington
>
> From: Gabe Smith, former Graff High School student
>
> Cause: To address opinions on the dress code that may not be getting the attention they deserve
>
> 2nd Paragraph *You, Dr. Herrington,* the Superintendent, have the power to shape the school district the way you want; however, I feel this authority is gradually being used to limit students more and more. As a result, students are unable to express themselves freely, and *it needs to be brought to your and the school board's attention that our students need to be given more credit and responsibility for themselves.* Although somewhat biased on this topic, I am writing *you all this* letter to invite and provoke change…*You all must realize* that forcing students to wear different colors at school will not effectively change their ideas about their personal life. This effort to stop gang violence only stops it at school, not anywhere else.

Writing the essay in a letter format did not guarantee that the argument itself would be more audience aware, though if the audience and topic were highly familiar (one's high school administration policies), then it may have helped the student contextualize the assignment and create appropriate appeals. In the example below, the student wrote to a vague, likely unfamiliar, audience. The writer, Steve, was a freshman biology major. His writing belief scale scores indicated a view of writing that was product (2.43) and avoided disagreement (2.84), and Steve's score on the Contingency aspect of his paper was low (2.65). In his proposal, he wanted the government to impose stricter regulations on bioengineered crops. However, his stated audience and the content of his paper belied a more general, research-paper type approach. In this way, his "Dear Organization" seemed an after-thought, tacked on perhaps to fulfill the assignment's requirement to address an audience, as he does not directly address or indirectly invoke an audience in his paper:

> Dear Biotechnology Industry Organization:
>
> The development of biotechnology has become a revolutionary way of producing products more efficiently and at greater numbers than what previous methods have given. Yet, a major concern in biotechnology is its application in agriculture. Many question whether or not it is truly safe to eat since they were in a way artificially created by man. It can be, but more research and time must be devoted to this project…As of now, the U.S leads the world in acreage of land that is devoted to bioengineered agriculture, which is 72% whereas other countries use less than 18%.

Steve goes on to provide information his audience, the "Biotechnology Organization," will likely already know, defining and explaining the genetic engineering of crops.

There are two interesting points to make about Steve's paper, and they can be applied to most of the papers with lower audience awareness scores. First, by addressing a nameless, faceless organization, as opposed to a person, writers likely found it difficult to visualize and appeal to their readers. Second, though audience awareness problems may arise simply because they target an overly general audience, students may also misunderstand their audience's interests and prior knowledge, thus resulting in fewer, or inappropriate, appeals. Had Steve reassessed his choice of reader, and revised it to include a group of concerned citizens or a Congressional representative with an interest in farming technology, then the level of prior knowledge he assumed of his reader may have been more accurate.

5. Significance of the Study

The purpose of this study was to explore the relationships between freshmen students' beliefs about knowledge and their writing beliefs, then understand how those beliefs relate to their writing in a first-year composition course. First-year composition classrooms are seen as "protopublic spaces" (Eberly, 1999) in which students move toward participation in broader conversations about policies that impact their lives. As such, students are encouraged to view discourse as a series of assertions and arguable claims as well as an interaction between audience and speaker (Bizzell, 1997; Hairston, 1997; Berlin, 1988). This type of setting was well suited for a study of epistemological and writing beliefs because rhetorical writing encourages consideration of audience and alternative perspectives (Yancey, 2001), which, at face, would seem to encourage epistemological growth and shifts in beliefs about writing.

5.1 Shifts in beliefs

The significant shifts in the students' beliefs about certain knowledge and fast learning across a college semester were surprising. Earlier longitudinal and cross-sectional studies of epistemological beliefs suggest that individuals' knowledge and learning beliefs shift relatively slowly across a span of years. Longitudinal work, such as that by Magolda (1992), underscored the slow nature of college students' shifts in beliefs across multiple semesters and academic years. Cross-sectional studies have noted similar trends across different educational levels, with significant epistemological differences among college students of different academic years (Schommer, 1990; Schommer, Crouse, & Rodes, 1992; Schommer 1993; Schommer 1998; 2004; Schommer-Aikins & Easter, 2006). King and Kitchener's (1994) cross-sectional study of over 1,000 non-college, junior college, and university students showed differences between entire academic years, not necessarily single academic semesters. Taken together, these researchers emphasized the slow evolution of undergraduate students' beliefs about the nature and stability of knowledge.

Thus, in the current study, the large shift in two subscales of the freshman students' Epistemological Beliefs, fast learning and certain knowledge, was unexpected. This

shift, with its large effect size (partial eta squared= .57 for Fast Learning and .51 for Certain Knowledge), may be the result of the content of the format of Writ 101. The course emphasizes accessible popular culture topics such as the culture of food, music, heroes and superheroes, sports, etc. Further, students are given direct instruction in analyzing and constructing arguments, recognizing rhetorical constituents including exigence, audience, and constraints (Bitzer, 1999). The course content, process model of writing, as well as the steady refrain that everything is indeed an "argument" may have prompted a relatively drastic epistemological shift in the first-year college students. Specifically, emphasis on contingency, the concept of conditional meaning, was emphasized across all sections of the course, and a key outcome of Writ 101 was that students would be able to explain the critical role of context in a text's interpretation. As there was not a control group in the design of the current study, the course cannot be identified as the contributor to students' shift in beliefs about certainty and fast learning. However, this feature of the course and its impact on epistemological growth is worth future investigation via study design that includes a group of students not enrolled in Writ 101.

Earlier research that did include a control group identified a link between epistemological growth and particular instructional strategies. Kienhues, Bromme, and Stahl (2008) found that German university students who received "refutational epistemological instruction" experienced larger shifts toward advanced epistemological beliefs compared to those who received instruction that was simply informational. Controlling for students' background knowledge about the instruction content (DNA fingerprinting), results indicated that the epistemologically "naïve" students whose instruction involved reading texts that were presented as two competing arguments experienced a shift in epistemology greater than their peers who read textbook passages (informational instruction) about the same issue. Similarly, the curriculum of Writ 101 instructed students to consider a variety of different perspectives about controversial issues, which included reading from multiple, often competing perspectives about salient issues (e.g. environmental conservation, the fast food industry, standardized testing, the US role abroad). In addition to analyzing arguments presenting opposing viewpoints, students were also instructed to write papers in which they clearly addressed audience members who may not agree with their viewpoint. As a result, Writ 101 coursework may parallel cognitive work similar to Kienhues and colleagues' (2008) "refutational instruction;" their work showed that specific types of instruction can shift students' beliefs toward a more contingent view of knowledge and an understanding of learning as a slow process.

5.2 Correlations between epistemological and writing belief measures and paper scores

Generally, in the study reported here, students' beliefs about knowledge and beliefs about writing were significantly related to one another early and late in the semester. That is, most of the subscales of the Epistemological Beliefs Questionnaire (EBQ) were

significantly correlated with those of the modified Writing Beliefs Inventory (WBI) at both administrations. However, late in the semester, the nature of the correlation changed as there were significant decreases in the students' epistemological beliefs of fast learning and certain knowledge, as well as their writing beliefs regarding writing as a product and that writing should avoid disagreement (Table 2). Subcales of the EBQ remained significantly correlated with one another at both administrations. The view of writing as a product, part of the Writing Belief scale, was moderately, but significantly, correlated with the EBQ subscales early in the semester. After a semester of Writ 101, a course that explicitly emphasizes a process model of writing, the students' scores were significantly lower with regard to viewing writing as a product. This change, combined with the significant decrease in students' epistemological beliefs about certain knowledge, may have contributed to a non-significant correlation between these two subscales later in the semester.

General epistemological beliefs, as measured by the Epistemological Beliefs Questionnaire, did not correlate significantly with aspects of the students' rhetorical writing. These findings align with those of Mateos and colleagues (2011), who found that epistemological beliefs were not significant predictors of undergraduates' argumentative writing. However, earlier work with undergraduates (Kardash & Scholes, 1996; Mason & Boscolo, 2004; Schommer, 1993b) reported a significant relationship between students' epistemological beliefs and the quality of their concluding paragraphs. A goal of the current study was collect "authentic" artifacts from students' coursework, as opposed to having students generate writing solely for the purpose of the study. Despite a common assignment prompt across all sections of the course and efforts to standardize scoring of these papers via a rubric (Appendix C) and scorer training, the amount of error variance across students' papers was probably large. The in-class presentation and support of the standardized assignment prompt likely varied across instructors, as did the support of students' research processes and degree of topic interest. Although the assignment itself was standardized, there were many opportunities for variation across students' approach to the Writ 101 proposal assignment. Thus, the relationship between writing performance and beliefs may be complicated by this variation in topics, source quality, feedback, and student motivation regarding the assignment. Prior work demonstrated a relationship between topic interest, epistemological beliefs, and argument quality (Mason & Boscolo, 2004). This suggests that follow up studies using course-based writing should include assessments of students' topic interest as well as an accounting of instructor and research support. Future work may also want to present students with a more controlled writing task either by limiting the number of different instructors supporting the assignment, the topic of the assignment, or the sources that students may use for the writing assignment, following the design of earlier studies.

Further, including data about students' overall writing performance in the course, assessed via multiple artifacts, may have supported a correlation between epistemological beliefs and writing, as well as general academic, performance. Such

findings would echo work relating epistemological beliefs, as assessed by the EBQ, with students' grades (Schommer, 1993a; Schommer, 2002; Schommer, Crouse, & Rhodes, 1992; Schommer & Dunnell, 1994). Specifically, the subscale assessing students' beliefs about the certainty of knowledge has been related to academic performance students across high school and college (Trautwein & Ludtke, 2007).

Although the EBI did not correlate significantly with components of the proposal paper, the modified Writing Beliefs Inventory subconstructs were significantly correlated with all of the Contingency paper factors. Recall that the Contingency factor of the paper included audience awareness, avoiding certainty, counterargument, and rebuttal (Table 4). Thus, to the extent that students believed that writing is a product, the purpose of writing is to report authority, and/or that good writing avoids disagreement, their paper Contingency scores were lower. This significant relationship between task beliefs and writing performance do not directly align with findings of Mateos and colleagues (2011), who found a significant relationship between university students' *reading* beliefs, but not those writing, relative to their writing performance. However, recall that in a pilot study informing this current study, the WBI factor structure did not replicate White and Bruning's original work with the scale. As a result I added items, based on focus groups, which specifically addressed students' beliefs about rhetorical writing (Appendix B). My revision of some items on the WBI, and their alignment with the specific task of rhetorical writing, may have contributed to the significant relationship between students' rhetorical writing quality and their beliefs about contingency in writing, as assessed by the revised WBI. That is, these new items may have assessed the beliefs that relate to students' thought process while they are writing rhetorically.

5.3 Audience awareness, epistemological growth, and implications for instruction

While audience awareness is emphasized as a key component of rhetorical writing instruction (Yancey, 2001), results of proposal paper scoring from the current study found low scores on the audience component of students' proposals (2.33 on a 5-point scale). Despite the Writ 101 assignment prompt that emphasized audience and consideration of alternative perspectives, students may have fallen back into known genres, including that of the "traditional" research paper, popular in high school and college courses (Bean, 2011). Audience awareness is a key feature of students' rhetorical writing development. Roen and Willey (1988) found that first-year composition students who focused on audience awareness as they revised received significantly higher essay scores. McAlexander (1994) identified the necessary prerequisites for writers to demonstrate audience awareness and explained that role-taking and perspective differentiation were key if writers were to engage and respond to their readers. In her conceptualization of audience awareness, "egocentric" writers (as she called them) cannot or do not imagine a reader, so they do not have feedback to

shape their writing. In contrast, McAlexander described "decentered" writers as those who have a more open sense of self and are thus receptive to imagined feedback.

The research paper paradigm for writing instruction continues despite criticism from composition teachers and researchers. Over 25 years ago, Richard Larson (1982) decried research papers as a "non-form of writing" and called for assignments that encouraged students' agency and ownership in their own research processes. Later, Davis and Shadle (2000) cast research paper assignments as a sort of academic hazing for new undergraduates, as "freshman research writing was not only to introduce students to the already known, it also sought to enforce a set of rules about the ownership of the known" (p.425). Research papers are an example of decontextualized writing, doing little to prepare students for active, critical civic engagement. Instead, such writing assignments subjugate students to the voices of "authorities" and "experts," perhaps even shortchanging students out of opportunities to shift their beliefs about knowledge and writing.

Balancing the emphasis on research-based writing and arguments in first-year composition courses, while simultaneously encouraging advanced beliefs about texts and writing, can be tricky. From early to late in the semester, students in the current study retained the belief that the function of writing is to report authorities' ideas. The content of Writ 101, like many first-year composition courses, emphasized information literacy (Yancey, 2001) in the form of selecting credible research sources and referencing those sources throughout the proposal argument as a means to enhance the writer's credibility. In so doing, the importance and use of quality sources is underscored, which perhaps accounts for the lack of change in students' view of writing to report the ideas of authorities.

Creating the "perfect storm" for epistemological growth likely includes courses that encourage students to read different types of arguments, analyze these arguments both as written assignments and in class discussion, and challenge students to consider alternative, competing viewpoints. Those of us who teach this rhetorical approach to reading and writing, such as in first-year composition, frequently see growth in our students' critical thinking and abilities to acknowledge multiple perspectives. However, further work exploring the role of course and assignment design in students' epistemological growth is warranted and would help us better identify types of academic tasks that promote such growth.

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Appendices

Appendix A - Epistemological Belief Questionnaire (EBQ) FACTOR LOADINGS

Subcategory	Early Late	Quick learning	Omniscient authority and Truth	Simple, Attainable Knowledge	Impatience with Ambiguity
Can't learn how to learn	Early	.65	-.11	.08	.00
	Late	.64	.05	-.09	.07
Success is unrelated to hard work	Early	.69	.24	.05	-.26
	Late	.72	.00	.27	-.28
Learning happens the first time	Early	.60	.04	-.11	.24
	Late	.58	-.07	.01	.34
Learning is quick	Early	.68	.07	.14	.15
	Late	.62	.29	-.01	.17
Don't criticize authority	Early	.17	.69	.19	.21
	Late	.16	.70	.25	.09
Knowledge is certain	Early	.00	.80	-.05	.02
	Late	.04	.82	-.08	-.03
Seek single answers	Early	-.06	.35	.48	.28
	Late	-.10	.27	.63	.07
Depend on authority	Early	-.06	-.07	.80	.12
	Late	-.08	-.04	.65	.20
Ability to learn is innate	Early	.28	.15	.74	.06
	Late	.34	.01	.66	.20
Avoid ambiguity	Early	-.03	.34	.24	.68
	Late	-.06	.41	.33	.58
Avoid integration	Early	.00	.26	.21	.43
	Late	-.03	.28	.27	.39
Concentrated effort is a waste of time	Early	.43	-.20	-.05	.68
	Late	.39	-.13	.01	.71

Appendix B - Revised items and factor loadings for the Writing Beliefs Inventory

Item	Time	Writing as a product	Writing is authority-based	Writing should avoid disagreement
When I write a paper, I try to imagine who will be reading it.*	Early	.63	-.24	.00
	Late	.71	-.08	-.09
Compared to other students in my year, I am a good writer.*	Early	.48	.09	-.03
	Late	.51	-.04	.06
Writing helps me better understand what I am thinking about.*	Early	.74	.09	.11
	Late	.77	.11	-.10
Writing requires going back over it to improve what's been written.*	Early	.54	.11	.07
	Late	.56	.17	.05
When I write a paper or essay, I think about readers who might disagree with my opinion.*	Early	.71	-.05	-.13
	Late	.64	-.19	.13
Good writers include a lot of quotes from authorities in their writing.	Early	-.07	.78	.07
	Late	-.16	.73	.05
The key to successful writing is accurately reporting what authorities think.	Early	.06	.81	.13
	Late	.04	.79	.14
Writing should focus around the information in books and articles.	Early	.11	.69	-.05
	Late	.09	.74	-.04
In order to persuade me, writers should stick to one side of the issue.	Early	.07	.00	.74
	Late	-.06	-.01	.77
I try to stick only to my opinion and not present too many sides of an issue when I'm writing.	Early	.07	-.04	.82
	Late	.14	-.03	.74
Writers who include opinions that disagree with their own weaken their argument.	Early	.07	.21	.75
	Late	.13	.23	.72

*These items were reverse-scored to align with the directionality of other scales.

Appendix C

Excerpt from Proposal Scoring Long Guide used by raters (Charney, 2002)

Category: Rebuttal

Score of 5

The proposal indicates an understanding of other positions on this issue and explicates them fairly and accurately. Conceding certain points and/or sympathizing with alternative perspectives, the text demonstrates a thorough understanding of this audience's values, positions, and previous actions. The text offers a direct and thoughtful explanation about why it nonetheless retains its stated position, demonstrating an ability to determine and respond to subtle disagreements within broader arguments

Score of 4

The proposal acknowledges other positions on the issue at several points, but doesn't necessarily characterize those other positions without bias. The text may concede certain points but without managing to respond directly or to offer compelling reasons for the continued disagreement(s), showing respect for the audience but not an in-depth knowledge of that audience's concerns, values, previous actions, etc.

Score of 3

The proposal includes some alternative positions, but the presentation of these is topical and thus comes across as incomplete. The proposal does not provide an adequate response to these alternative views and/or does not adequately present these perspectives.

Score of 2

The proposal may acknowledge other positions but without indicating much respect or concern for those positions. It may demonstrate some sense of probable rebuttals, but mostly it responds to straw-man arguments that have been attributed to the opposition unfairly.

Score of 1

The proposal does not acknowledge other positions and/or it does not anticipate objections to its own position(s)