

The authors assessed writing attitudes and epistemologies of 117 first-year and 329 upper-level undergraduates. Attitude scales assessed enjoyment of writing, self-ratings of writing ability, and belief in writing as learnable. Epistemological scales measured absolutism (belief in knowledge as determinably true or false), relativism (belief in the indeterminacy of all claims), and evaluativism (belief that truth can be approximated). Absolutism correlated negatively with writing grades and verbal aptitude, whereas evaluativism exhibited a weak positive correlation with both. Students with higher evaluativism tended to enjoy writing more and to assess themselves as good writers. Upper-level students were less absolutist and marginally more evaluativist than first-year students. Differences in attitudes and epistemologies emerged between men and women and among upper-level students in four disciplinary groups. The authors sketch some implications for writing pedagogy.

“I’m Just No Good at Writing”

Epistemological Style and Attitudes Toward Writing

DAVIDA CHARNEY

Penn State University

JOHN H. NEWMAN

Mount St. Mary’s College

MIKE PALMQUIST

Colorado State College

Every writing teacher knows the frustration of having students who decline opportunities to revise their papers, who avoid conferences and peer review sessions, who persist in unsophisticated rhetorical

Authors’ Note: We thank Jim Martin for his help in conceptualizing this work and preparing materials for the study. Requests for reprints should be sent to Davida Charney, English Department, 117 Burrowes Building, Penn State University, University Park, PA 16802. E-mail may be sent to Charney at irj@psu.edu; Newman at jnewman@mismary.edu; and Palmquist at mpalmquist@vines.colostate.edu.

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strategies even after instruction, who just don't seem to try to improve their writing skills. Why do some students seem passive or even resistant toward learning to write, whereas others are eager to identify writing problems and try new approaches to solving them? The plausible explanations are of course plentiful. The nature of the assignments themselves and the classroom's reward structure play important roles in how students interpret what they are supposed to do (Nelson, 1990, 1993). Equally important, however, may be students' attitudes and beliefs about themselves, about the nature of such skills as reading and writing, and about knowledge itself. Such attitudes may affect the effort and persistence students devote to a writing task, their willingness to try new strategies, and their receptiveness to instruction and feedback (Zimmerman & Bandura, 1994).

Early research found that students who are apprehensive about writing or who lack confidence in their writing ability are less motivated to write frequently, write less well when they do, and avoid academic disciplines they perceive as writing intensive (see the review by Hillocks, 1986). Much of the subsequent research on attitudes toward writing has focused on basic writers or writers with learning disabilities (e.g., Graham, Schwartz, & MacArthur, 1993). Little work has investigated variations in attitudes across the whole spectrum of writing abilities, or whether students in various academic concentrations and at different stages in their academic careers have different attitudes toward writing. Recently, however, some researchers have begun to investigate how attitudes relate to aptitude and outcome measures. Pajares and Johnson (1994) found that undergraduates who were apprehensive about writing had lower confidence scores and that their ratings of their writing abilities were predictive of writing performance. Similarly, Zimmerman and Bandura (1994) found that freshmen with higher perceived self-efficacy set higher goals for themselves and for the quality of writing with which they would be satisfied, which in turn led to higher course grades.

One attitude toward writing that has recently gained some attention is the belief that writing ability is a special gift, akin to talent or genius, that certain people are born with and that others can never hope to acquire. This view of writing pervaded writing instruction for nearly a century in what Young (1980), citing Fogarty (1959), has called the "current-traditional paradigm." The current-traditional paradigm is associated with the belief that rhetorical capabilities, such as invention, draw on the essential nature or "bent" of the writer's mind; current-traditionalism therefore confines writing instruction to

the "mechanical" issues of form and style that are "learnable," that is, those areas that may be improved with training. As Young noted, the view of writing ability as an unlearnable gift persists in contemporary neo-Romantic approaches to writing instruction. Promoting this view, however, may reinforce unproductive attitudes toward learning to write. In a survey of 247 college freshmen, Palmquist and Young (1992) reported that students who viewed writing ability as a gift—especially those who believed they lacked the gift—had significantly more negative attitudes about writing than students who viewed writing as a learnable skill. Such students were more apprehensive about writing, rated their own writing ability lower, were less confident that they could master certain writing skills or genres, and had more negative attitudes toward previous writing teachers. These associations suggest that beliefs about the learnability of writing might also influence students' performance. However, Palmquist and Young's study did not include performance measures, such as verbal achievement scores or grades in writing classes.

The general connection between beliefs about learning and scholastic achievement has been studied extensively (for reviews, see Bandura, 1989; Heyman & Dweck, 1992; Pintrich, Marx, & Boyle, 1993). Higher achievement in school has been linked with more active participation. In turn, active participation is related to learners' beliefs about their abilities and about the implications of success and failure. Active learners are more likely to see intelligence as a mutable quality that they can refine with attention and practice. Active learners are challenged by difficult tasks; if they fail, they try again or consider other strategies for succeeding the next time. Their primary goal is to *develop* their competencies rather than to *judge* their competence. Less active learners tend to see intelligence as a fixed, one-time, lump-sum allotment that either is or is not sufficient for the task at hand. These students are more likely to take setbacks or negative feedback as verdicts on their personal intrinsic worth rather than as prompts for greater effort or a change in strategy. When faced with failure, they give up or gravitate toward activities at which they succeed more often. Although the connection is speculative, the profile of passive learners suggests that viewing writing ability as a lump-sum allotment or gift may discourage students from investing much effort in learning to write.

As noted above, specific beliefs about the learnability of writing may influence students' progress toward becoming better writers. In addition, students' beliefs about the nature of knowledge itself may

be important for shaping their ideas about the purposes of writing and about the relationships writers should establish with their readers. Considerable research on the epistemological and intellectual development of high school and college students has grown out of Perry's (1970) study of Harvard undergraduates. Perry conducted intensive interviews in an effort to trace how intellectual and ethical stances changed during the college years. The resulting scheme was quite complex but may be described as a progression of stages: First, in the "dualism" stage, students unreflectively accept an authority's judgment of whether some fact is true or false; in the second "multiplicity" stage, they acknowledge that there are some areas where several plausible options co-exist and the true state of affairs is uncertain, but they remain confident that a single truth will eventually emerge; in the "relativism" stage, they give up on the possibility of universal truth and accept all claims as equally legitimate and contingent on context; fourth, they accept that even if contextual relativism predominates, it is possible to evaluate competing claims pragmatically within a framework of beliefs ("commitment in relativism").

Despite the fact that the basic pattern Perry described has been replicated in a wide range of studies, his philosophy and methods have attracted some criticism. Some object to the methodological limitations in the original study; others are uneasy with the very concept of categorizing epistemologies. Categories of epistemologies can seem rigid and deterministic, especially when ordinary people seem perfectly capable of taking dualist positions on some topics or on some occasions and relativist positions on others. Other critics object to the element of judgment underlying a stage model that purports to prescribe "socio-cognitive development," or "intellectual and ethical maturity." Stage models assume that absolutism and relativism are inherently immature or deficient epistemologies, even though they seem to be frequent in normally functioning and even well-educated adults.

Recent work by Newman (1993) and his colleagues (Martin, Silva, Newman, & Thayer, 1994) has brought into question both stage models and the related notion that a person's beliefs can be characterized by a single predominant epistemology. They have explored the idea that people can simultaneously hold elements of different epistemologies and that their "epistemological style" at any given time is a mix of approaches. Newman (1993) has developed a reliable survey instrument to assess absolutism, relativism, and evaluativism as independent constructs. These constructs are related to Perry's

terms—for example, absolutism has component beliefs that are similar to dualism—but they are not synonymous. Because we adopt Newman's instrument in our study, it is worth briefly defining these constructs:

- *Absolutism* is characterized by a belief that facts are either true or false and that truth can be fully determined through objective observation of the world or in consultation with valid authorities (parents, teachers, experts, etc.). In this view, if two authorities disagree, then one or both is wrong. Because facts about the world can be fully determined, strong absolutists reject personal responsibility for ideas and decisions—things just are the way they are.
- *Relativism* denies the possibility of objectively determining truth or falsity; relativism equates the legitimacy of all sources of knowledge. Because access to objective reality is limited or impossible, facts become synonymous with subjective opinions—and anyone's opinion is just as good as anyone else's. A strong relativist believes that decisions are only valid with respect to a specific situation and viewpoint, so conflicting positions are inevitable. Decisions may be either pragmatic or whimsical; agents bear no responsibility for their decisions, because situations and viewpoints are always in flux. The ultimate appeal is that an action seemed like a good idea at the time.
- *Evaluativism* allows for legitimate disagreement about the truth, but it does not treat all opinions as equally valid and objective truth as inherently unknowable. Rather, the evaluativist believes that we move toward truth by using good methods and sound logic, by assessing the validity of evidence and expertise, by empirically testing ideas, and by participating in community discussion. Strong evaluativists recognize that people may operate within different perspectives or frameworks and that the choice of framework can influence the validity assigned to facts and evidence. Furthermore, frameworks themselves can be compared and evaluated. Unlike absolutists and relativists, evaluativists accept personal responsibility for decisions because the processes of forming beliefs and setting values can themselves be inspected.

As in previous studies of epistemology, Newman (1993) found that absolutism scores declined between high school and graduate school and that evaluativism scores increased across the same groups. However, these epistemologies were not inversely related, as one would expect in a stage model. A stage model that assumes a progression from absolutism, through relativism, to evaluativism, would predict that one could identify successive points at which most students would score high on one epistemology and low on the other two.

However, Newman found that students who scored low in absolutism were *not* more likely to have high scores in relativism or evaluativism. Furthermore, relativism did not decline as evaluativism increased; rather, these epistemologies tended to be positively correlated.

Newman's findings suggest that people can and do operate with beliefs drawn from seemingly inconsistent epistemologies—a notion consonant with rhetorical rather than logico-deductive theories of mind (Perelman & Olbrechts-Tyteca, 1969). The differences between high school students and graduate students also suggest that instruction can influence a student's belief system, as do other studies of epistemology and critical thinking skills (Kuhn, Amsel, & O'Loughlin, 1988; Schommer, 1990). Therefore, rather than seeing students as passing linearly through absolutist and relativist stages to the ultimate goal of evaluativism, it is more appropriate to see absolutism, relativism, and evaluativism as parallel epistemological styles that can mix in varying concentrations. In this view, it becomes important to ask how strong students' absolutist beliefs are in relation to their evaluativism and relativism, or whether a student is more absolutist than his or her peers, or in what situations students consider absolutism to be justified. For these reasons, we will avoid referring to people as "absolutists" or "evaluativists" and will instead refer to the strength of their scores on these scales.

The relationship of epistemological styles to success in writing classes and attitudes toward writing has not been systematically investigated, though such an approach has recently been undertaken in studies of reading (Ehrlich, Kurtz-Costes, & Loridant, 1993). It is quite plausible, however, that beliefs about the nature of knowledge influence students' judgments of the importance of writing skills, particularly those concerning adaptation to the viewpoints of readers. Beliefs about knowledge certainly influence the priorities of writing instructors. For many writing instructors, the most important skills are rhetorical strategies for addressing potential readers—learning how much and what kinds of evidence to provide to support a claim, how to anticipate and rebut possible objections, when to make concessions and qualify claims, and when to abandon a position as untenable. These pedagogic goals are most consonant with a strongly evaluativist epistemology.

In its strongest form, absolutism explicitly exempts certain beliefs from critical examination. Likewise relativism, in its strong form, shuns critical evaluation by taking all beliefs as equally indeterminate. Thus, students with strongly absolutist or relativist epistemolo-

gies may reject rhetorical strategies as irrelevant. If students see their positions as self-evident, they are unlikely to believe that readers can reasonably take alternative positions. Students with strongly absolutist styles may characterize writing as gathering facts from trusted authorities and then stating those facts clearly so as to inform ignorant readers. They may view refutation as unnecessary for rational readers—after all, why waste time entertaining false beliefs? And they may see concessions or qualifications as hypocritical tactics for watering down the truth for the sake of less clear-sighted readers. Alternatively, strongly relativist students may resist learning persuasive strategies because they see no occasion for attempting to change another reader's mind. Because every situation is different and every person is entitled to an opinion, attempts to formulate general rhetorical strategies may seem oppressive and futile.

In earlier research, Newman (1984; Newman & Martin, 1989) demonstrated that epistemology influences spoken discourse. Pairs of evaluativist students were significantly better than relativist pairs at taking turns in a conversation, and the evaluativists improved even more when they disagreed. When discussing topics on which they generally agreed, relativist and evaluativist pairs introduced about the same number of new themes. However, when discussing topics on which the participants disagreed, evaluativist pairs introduced fewer new themes than relativist pairs. Evaluativist pairs also had fewer and shorter lapses in the conversation than relativist pairs. In sum, evaluativist partners paid more attention to their interlocuter, investigated disagreements more fully, and held denser, higher quality conversations than relativist partners.

Recent research also indicates that students' epistemologies can influence the content and tone of their papers. Hays and Brandt (1992; Hays, Brandt, & Chantry, 1988) found that students with more absolutist beliefs were less likely to include rhetorical moves toward hostile audiences. Hays and Brandt asked high school and college students to write two versions of an argumentative essay, one addressed to a friendly audience and the other to a hostile one. They categorized students' epistemologies using a text-analytic technique based on the stages of the Perry scheme. Students on the dualist end of the scale either ignored opposing viewpoints altogether or became hostile and pejorative toward their readers. In contrast, students characterized as more relativistic were more likely to acknowledge

opponents' positions and to respond to them with refutations or concessions.

In their study of students' beliefs about writing, Palmquist and Young (1992) did not investigate how writing attitudes relate to verbal achievement or to performance measures, such as grades in writing classes. Nor did they examine whether attitudes toward writing systematically vary among different populations of students, such as those in the sciences and in the humanities, or whether attitudes toward writing change over time. The present study attempts to replicate and extend this work in these directions. Our goal is to explore further how the various components of epistemological style are related to attitudes toward writing and to success in writing classes.

At the outset, we speculated that certain attitudes toward writing might be associated with particular epistemological styles. For example, although Schommer (1990) has argued that beliefs about learning, authority, and evidence are independent, the belief that writing ability is a gift seems consistent with an absolutist view, in which personal qualities and abilities are viewed like facts as fixed, immutable traits, rather than as emergent and contingent tendencies. We also wished to explore how epistemological styles and attitudes toward writing change during the college years and whether particular beliefs and attitudes are associated with particular disciplines. For example, are science students less liable to rely on authority or to believe in the certainty of knowledge than students in the humanities? Do students in different disciplines have systematically different attitudes toward writing? Although undergraduates are not yet full-fledged members of a discipline, some research has shown that they do take on or reflect attitudes in their prospective fields (Charney, Rayman, & Ferreira-Buckley, 1992). Yet, little research has been conducted on discipline-specific attitudes toward writing and how they arise.

The goal of this study, then, was to integrate and extend two strands of research, one on attitudes toward writing ability and the other on beliefs about knowledge. Using survey data, we assessed the writing attitudes and epistemological styles of first-year and upper-level undergraduates in a range of disciplines. We explored the relationships among these measures as well as their relationship to the students' verbal ability and their success in writing classes.

METHOD

Participants

The participants in this survey study were 446 undergraduates at a large state university, where all students are required to take two semesters of composition, one general course taken during the freshman year and one upper-level course that reflects their major. Students select a version of the upper-level course, depending on their major, and can choose to take it at any point after their fifth semester. The participants included 117 undergraduates enrolled in the freshman course and 329 enrolled in one of four versions of the upper-level course: Writing in the Social Sciences ($n = 81$), Writing in the Humanities ($n = 68$), Technical Writing ($n = 92$), and Business Writing ($n = 88$). The mean semester standing for the entire sample was 5.4 ($SD = 2.3$) with a bimodal distribution; 103 participants were freshmen (semesters 1 and 2) and 136 were juniors (semesters 5 and 6). Men and women were about equally represented in the sample, with 208 women (47%), 229 men (51%), and 9 participants who did not respond to this survey item. All students participated in the study voluntarily as part of an in-class activity in their writing course.

Procedure

The surveys were administered within the first 3 weeks of the semester by the instructors of the writing courses. The instructors began by explaining the study and inviting students to participate; an alternative in-class writing activity was provided to a very few students who declined to volunteer. Students completed the survey at their own pace; most required about 50 minutes of the 75-minute class period.

Survey

The complete survey contained 84 items: 8 items concerned demographics and reactions to participating in the study; 16 items concerned attitudes toward writing; and 60 items concerned epistemological style.

Upper-level students identified their disciplinary affiliation by indicating the writing class in which they were enrolled (Writing in

Learnability Subscale

1. Good teachers can help me become a better writer.
2. Good writers are born, not made.^a
3. Some people have said, "Writing can be learned, but it can't be taught."
Do you believe it can be learned?
4. Some people have said, "Writing can be learned, but it can't be taught."
Do you believe it can be taught?

Writing Enjoyment Subscale

5. I avoid writing.^a
6. I enjoy writing.
7. Discussing my writing with others is an enjoyable experience.
8. Writing is a lot of fun.

Writing Self-Assessment Subscale

9. I'm no good at writing.^a
 10. I am a good writer.
 11. I have always been a good writer.
 12. I believe I was born with the ability to write well.
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Figure 1: Survey items on attitudes toward writing.

a. Reversed scoring.

the Humanities, Writing in the Social Sciences, Technical Writing, or Business Writing). First-year students were enrolled in a freshman writing course that does not separate students by discipline. In an effort to trace disciplinary patterns in this group, we asked first-year students to indicate which version of the upper-level course they expected to take. None of the analyses based on grouping first-year students according to these responses produced reliable differences in attitudes or epistemologies and will not be discussed further.

The bulk of the survey addressed attitudes toward writing and epistemological style. These items took the form of assertions; participants were asked to rate the degree to which each statement reflected their views in a 7-point Likert-type scale. The items about writing were presented before items on epistemological style. The order with which the items in each section were presented remained fixed for all participants, but items for both the writing subscales and epistemological style had been randomly mixed while the form was prepared.

Writing attitude subscales. The items measuring attitudes toward writing are presented in Figure 1. They consisted of items from three subscales identified in Palmquist and Young (1992) that assessed belief in the learnability of writing (whether it is a gift of select individuals or a skill that anyone can learn), writing apprehension/enjoyment, and self-ratings of writing ability. (Also

included were three new trial items on the learnability of writing and an item on the purpose of writing that did not contribute to the analysis and will not be discussed further.)

Investigation indicated that the three subscales were reliable (learnability, Cronbach's $\alpha = .65$; enjoyment/writing apprehension, $\alpha = .80$; and self-assessment of writing ability, $\alpha = .82$). These values indicated that the responses to items within a subscale were very consistent and replicate those reported for these scales in Palmquist and Young (learnability, $\alpha = .67$; writing apprehension, $\alpha = .82$; and self-assessment of writing ability, $\alpha = .77$). An exploratory factor analysis of participants' responses to these items matched the a priori three-factor model, although a two-factor structure produced a somewhat better fit. To allow comparison to Palmquist and Young's results, we retained the three separate scales. We departed from their terminology in calling the second factor "enjoyment" rather than "apprehension." In their apprehension scale, five items (Items 5-8 and Item 10 in Figure 1) were drawn from Daly and Miller's (1975) writing apprehension scale. These items have been found to accurately predict scores yielded by Daly and Miller's entire writing apprehension survey (Hartman, Neuwirth, Kiesler, Sproull, Cochran, Palmquist, & Zubrow, 1991; Hartman, personal communication). We found, as did Palmquist and Young, that Item 10 loaded more strongly on the self-assessment factor. The remaining four items seem more related to the enjoyment of writing rather than apprehension, so we will refer to the subscale as an enjoyment scale. We recognize the continued link to the literature on writing apprehension as a basis for interpretation. We note, however, that enjoyment and apprehension are not mutually exclusive emotional states; further research on writing apprehension may be required to define and reassess these constructs.

Epistemological styles subscales. The 60 items assessing epistemological style were a subset of those developed and tested in Newman (1993). They consisted of three 20-item subscales assessing absolutism, relativism, and evaluativism and exploring the component beliefs of each style concerning attitudes toward authorities, access to objective reality, personal responsibility for actions and judgments, and the possibility of certainty.

Absolutism items assessed the belief that facts are either true or false and that truth can be fully determined through objective observation of the world or in consultation with valid authorities. Some absolutism items were:

- I know about things from what I see and hear, and what I've been taught. I believe in what I've learned this way because, after all, seeing is believing. Also, I'm sure that what I know is true because my teachers and my parents believe the same thing too. Why would anybody believe something else? I mean the facts are black and white.
- If you want to know anything for sure, you have to ask an authority on it. But, sometimes, some of them don't know enough and can get things wrong. That makes it hard on me; because, how can I tell if an authority is bad?
- I don't think you really have to prove the things we know. There is only one real answer to any problem, so there is nothing to choose between. I mean, if you pay attention at all to what's going on in the world, you end up believing what's right. So, what's to prove?

Relativism items assessed the belief that it is impossible to determine truth or falsity objectively and that all claims are therefore equally indeterminate. Sample relativism items included:

- No one can say whether or not the world we see and feel is really there. Objective knowledge simply doesn't exist, everything is subjective. What I know doesn't have to be what someone else knows, because we might not have anything in common. I guess people just can't understand reality in a concrete way.
- Everyone has a right to their own opinion no matter what it is. One thing might be right for me and something else right for someone else. I know what is right for me, but I wouldn't say it was a better idea because people shouldn't say they are better than other people.
- I don't believe you can make decisions that go beyond the exact situations you're dealing with. I can say an idea is stronger or weaker for this particular time; but there aren't any rules that can decide something for all cases, so I prefer not to state things very definitely. Sometimes, you can't give an opinion because there's no way to decide.

Evaluativism items assess the belief that truth can be approached through good methods and sound logic, even though there can be legitimate disagreement and uncertainty about the truth. Sample evaluativism items were:

- When I make a decision, I always consider what the authorities have to say. I don't blindly accept their point of view; I try to decide how good an expert they are and how closely they've studied their subject. Then, if I approve of them, I may use their ideas for myself.

- I think that any point of view is determined by the structure of information surrounding it. Even facts are different when looked at from different directions. Knowledge is just basically subjective. To achieve any sort of understanding, you have to examine the method by which the knowledge was gained, not just evaluate the facts alone. That's what makes some opinions better than others.
- In order to decide on my own point of view, I use evidence from one set of views and compare it with the evidence for another set of views. Of course, I need to consider the quality of evidence within a view too. It's the quality of evidence overall that allows me to balance views or decide between them.

The exploratory factor analysis of our participants' responses to these items indicated that we had replicated Newman's factors and that the scales were reliable and independent. Based on Cronbach's alpha, the items within each scale showed good reliability (absolutism, $\alpha = .82$; relativism, $\alpha = .83$; and evaluativism, $\alpha = .87$). These reliabilities were reasonably close to those Newman (1993) reported for his 75-item scale (absolutism, $\alpha = .92$; relativism, $\alpha = .88$; and evaluativism, $\alpha = .85$) and maintained standards required for diagnostic tests. The construct validity of these scales was supported in previous research by Newman (1993), which demonstrated factor validity, and by Martin et al. (1994), which provided convergent validity with other epistemological measures.

Other Data Sources and Data Analysis

Relationships among groups of participants (as defined by gender, semester standing, academic discipline, and median-splits on selected subscales) were examined using multivariate analyses of variance (MANOVAs), with final course grades and scores on the writing attitude subscales and epistemological style subscales as dependent measures.

We collected SAT scores and final grades from current writing courses from 374 students who agreed to release this information. After completing our principal analyses with MANOVAs, we repeated them with verbal SAT scores (SAT-V) as a covariate. These analyses remove whatever systematic variance in the data can be attributed to verbal aptitude. If the covariate analysis produces the same result as the primary analysis, the robustness of the effect strengthens the interpretation of the primary analysis. If effects in the

covariate analysis become nonsignificant, then our results must be qualified as possibly attributable to verbal ability. Because SAT scores were not available for all students and because individual students skipped occasional items, the number of students varies slightly in the different analyses. We report the numbers of students in each analysis below. No significant differences (by Student's *t* at the .05 level) were found between students who provided and those who withheld their SAT-V scores on any of the writing attitudes or the epistemological styles.

RESULTS AND DISCUSSION

Although the primary goal of this study is to investigate how attitudes and epistemological styles are related, we will begin by focusing separately on the attitude scales and on the epistemological scales. We will discuss first our success at replicating the findings in earlier work on these measures (Newman, 1993; Palmquist & Young, 1992). Then we will consider whether these attitudes and beliefs relate to students' verbal aptitude, their disciplinary area (humanities, social sciences, business, or science/engineering), their gender, and their success in writing classes. Finally, we will turn to relationships among attitudes toward writing and epistemological styles to see if particular attitudes toward writing are associated with particular beliefs about knowledge itself.

Attitudes Toward Writing

Students in our sample tended to view writing as a learnable skill; the average score for this scale was 20.4 ($SD = 3.9$) out of a maximum of 28 (summing scores across the four items). They had more mixed views of their own writing ability and how much they enjoyed it; the average enjoyment score was 15.8 ($SD = 5.3$) out of 28, and the average self-assessment score was 17.6 ($SD = 4.7$) out of 28.

How writing attitudes relate to each other and to writing performance. Students who enjoyed writing more were also more likely to assess themselves as good writers ($r = .58, p < .0001$), an association that Palmquist and Young had also found between these scales ($r = .57$). We obtained positive but weak correlations between believing that writing is learnable and enjoying writing ($r = .23, p < .0001$) and

Table 1

Average Enjoyment and Self-Assessment Scores^a and Writing Course Grades^b for First-Year and Upper-Level Students Grouped by Median Split of Responses to Measure of Belief in the Learnability of Writing

	Low Belief in Learnability			High Belief in Learnability		
	First-Year (n = 44)	Upper-Level (n = 135)	Marginal	First-Year (n = 61)	Upper-Level (n = 125)	Marginal
Enjoyment of writing	14.2 (5.2)	15.3 (5.3)	15.0	16.6 (5.2)	16.9 (5.3)	16.8
Self-assessment of writing ability	15.8 (4.8)	17.0 (5.4)	16.7	17.4 (4.1)	18.8 (4.3)	18.3
Writing course grade	2.59 (.79)	3.15 (.79)	3.01	2.58 (.99)	3.34 (.54)	3.09

NOTE: Standard deviations are in parentheses.

a. Maximum score = 28.

b. Four-point scale.

between believing that writing is learnable and high self-assessments of writing ability ($r = .17, p < .0001$). These correlations were weaker than those Palmquist and Young had found between these scales (learnability/enjoyment, $r = .38$; learnability/self-assessment, $r = .31$). We can only speculate on why our correlations were weaker; we note that the participants in Palmquist and Young's study were all first-year students and were somewhat less likely overall to believe that writing is learnable.

To investigate interrelations among writing attitudes further, we created two groups representing high and low belief in the learnability of writing by splitting the scores at the median. We then crossed learnability (high and low) and class (first-year and upper-level) and conducted a 2×2 MANOVA, with enjoyment, self-assessment, and grade in the current writing course as dependent measures. The MANOVA revealed a significant multivariate main effect on the dimension of learnability ($F = 4.38, p < .005$). Subsequent univariate analysis indicated significant differences between high and low learnability groups for enjoyment and self-assessments. As indicated in Table 1, students who perceived writing as learnable enjoyed

writing significantly more than students who saw it as an unlearnable gift, $F(1, 361) = 10.24, p < .001$. The high learnability group also assessed themselves as good writers significantly more often than the low learnability group, $F(1, 361) = 9.75, p < .002$. Although belief in the learnability of writing was associated with positive attitudes toward writing, it did not lead to differences in performance in writing classes. The high and low learnability groups did not significantly differ in their final grades in writing courses.

The MANOVA also revealed a significant multivariate main effect on the dimension of class ($F = 19.14, p < .0001$). Univariate analyses revealed that upper-level students had higher self-assessments of writing ability than first-year students, $F(1, 361) = 5.53, p < .03$, and also received higher final grades, $F(1, 361) = 55.44, p < .0001$.

The MANOVA was repeated with verbal aptitude as a covariate. SAT-V was a significant covariate of enjoyment of writing, self-assessment of writing ability, and grade. However, when verbal ability was partialled out, the means and main effects remained largely the same; only the difference in self-assessment between first-year and upper-level students became nonsignificant. Unless noted otherwise, including verbal aptitude scores as a covariate in the MANOVAs did not significantly alter the results.

These results indicate that students who had low belief in the learnability of writing had lower opinions of their own writing ability. To investigate whether a combination of both attitudes would lead to disproportionately worse performance in writing classes, we again used median splits to cross high and low belief in learnability with high and low self-assessments. This MANOVA produced significant multivariate main effects for both self-assessment ($F = 58.36, p < .0001$) and learnability ($F = 4.36, p < .01$). Subsequent univariate analyses were performed. As Table 2 indicates, students with high self-assessments of their writing ability enjoyed writing significantly more than students with low self-assessments, $F(1, 361) = 107.03, p < .0001$. Students with high self-assessments also received higher grades in writing courses, $F(1, 361) = 9.85, p < .002$ (however, the effect of self-assessment on grades became marginal, $F[1, 231] = 2.48, p = .12$, when verbal ability was included as a covariate in this analysis). Students who believed writing is learnable were again found to enjoy writing more than students with low belief in learnability, $F(1, 361) = 8.16, p < .005$. However, combining low belief in learnability and low self-assessments did not interact to produce disproportionately less

Table 2
Average Scores on Enjoyment Scale^a and Writing Course Grades^b for Students Grouped by Median Splits on Belief in the Learnability of Writing and Self-Assessment of Writing Ability

	Low Belief in Learnability		High Belief in Learnability	
	Low Self-Assess (<i>n</i> = 104)	High Self-Assess (<i>n</i> = 75)	Low Self-Assess (<i>n</i> = 97)	High Self-Assess (<i>n</i> = 89)
Enjoyment of writing	12.7 (4.4)	18.2 (4.9)	14.6 (4.5)	19.2 (5.0)
Writing course grade	2.89 (.82)	3.18 (.79)	2.98 (.88)	3.22 (.70)

NOTE: Standard deviations are in parentheses.

a. Maximum score = 28.

b. Four-point scale.

enjoyment or lower grades. These results are generally consistent with those of Pajares and Johnson (1994).

Gender effects. A class by sex 2×2 MANOVA on writing attitudes produced significant multivariate main effects for both independent variables, class ($F = 3.67, p < .01$) and sex ($F = 5.60, p < .001$). Univariate analyses replicated the self-assessment difference favoring upper-level students reported above. Univariate analyses of the sex variable revealed that women were more likely than men to view writing as learnable (women 21.0 [3.7], men 20.0 [4.0]), $F(1, 399) = 7.50, p < .006$. The learnability difference remained stable when these analyses were repeated with SAT-V as a covariate. Univariate analyses also revealed that women reported enjoying writing more than men (women 16.5 [5.8], men 15.3 [4.7]), $F(1, 399) = 6.19, p < .01$. However, when variability attributable to verbal aptitude was partialled out, the difference in enjoyment became nonsignificant.

We also looked for gender differences in a sex by class MANOVA with SAT scores and grades as dependent variables. The analysis again produced significant multivariate main effects for class ($F = 9.96, p < .0001$) and sex ($F = 8.46, p < .0001$). Univariate investigation, in addition to replicating the finding of higher grades in upper-level classes, revealed that the upper-level classes had a more select group of students with higher verbal and math aptitude scores than first-year classes; these differences should be considered in interpreting comparisons of performance differences between the classes. Univariate analyses also revealed that women received higher grades in

Table 3
Average Scores on Writing Attitudes Scales,^a Verbal Aptitude (SAT-V), and Final Course Grades^b for Upper-Level Students in Four Academic Areas

	Academic Discipline			
	Humanities	Business	Social Science	Science/Engineering
Writing attitudes	(n = 65)	(n = 85)	(n = 76)	(n = 90)
Enjoyment of writing	18.0 (5.5)	16.4 (4.9)	15.9 (5.1)	14.1 (4.9)
Belief that writing is learnable	20.2 (3.4)	20.6 (3.9)	20.8 (3.6)	19.9 (4.1)
Self-assessment of writing ability	18.8 (5.1)	18.5 (4.1)	17.4 (5.0)	17.6 (4.8)
Academic measures				
SAT-V	518 (94)	468 (69)	471 (91)	541 (87)
Writing course grade	3.06 (.94)	3.24 (.62)	3.20 (.70)	3.38 (.48)

NOTE: Standard deviations are in parentheses.

a. Maximum score = 28.

b. Four-point scale.

writing classes than men (women 3.28 [.64], men 2.95 [.83]), $F(1, 235) = 9.59, p < .002$. No significant differences were found between sexes for verbal scores; men were found to have higher math aptitude scores than women.

How attitudes vary by academic discipline. To investigate attitudes toward writing in different disciplines, we compared the scores of students in the four versions of the advanced writing class (Writing in the Humanities, Writing in the Social Sciences, Business Writing, and Technical Writing) in a discipline by sex MANOVA, which produced a significant main effect of discipline. Univariate analysis revealed, as indicated in Table 3, that enjoyment of writing varied significantly across these four groups, $F(3, 308) = 7.43, p < .001$. The inclusion of SAT-V scores as a covariate in a repetition of these analyses strengthened this effect. Students in the humanities reported enjoying writing more than all other groups; scores for business and social sciences students were intermediate and did not differ from

Table 4
Correlations Between Epistemological Styles, Class Standing, Grade in Writing Courses, and Verbal Aptitude

	Correlations Among Epistemological Styles		
	Relativism	Evaluativism	
Absolutism	-.10* (n = 403)	-.0003 (n = 400)	
Relativism		.42** (n = 403)	

	Correlations of Epistemological Styles and Academic Measures		
	Semester	Grade	SAT-V
Absolutism	-.26** (n = 420)	-.23** (n = 351)	-.36** (n = 249)
Relativism	-.06 (n = 424)	-.05 (n = 355)	-.06 (n = 252)
Evaluativism	.06 (n = 421)	.20** (n = 354)	.15* (n = 254)

* $p < .05$; ** $p < .0001$.

each other; scores for science/engineering students were significantly lower than those in the social sciences (post hoc comparisons tested by least significant differences [LSD], $\alpha = .05$). No significant differences emerged among these groups for belief in the learnability of writing or self-assessments of writing ability, and no sex differences emerged.

Interestingly enough, although students in science and engineering reported enjoying writing least, this attitude did not hinder their performance in writing classes; their grades were at least as good as students in the other groups. In fact, their grades seem slightly higher than those of other groups, but the difference in grades across disciplines was only marginally significant ($p = .06$). On the other hand, the SAT-V scores of students in science and engineering and in humanities were significantly higher than those of students in business and social sciences, $F(3, 176) = 7.96$, $p < .0001$. The SAT-V scores reflect effects of selection in the various disciplines and attrition from the cohort that entered college. This selectivity may be responsible for significant differences in grades between the disciplinary groups and between first-year and upper-level students.

Epistemological Styles

How epistemological styles relate to each other and to writing performance. The three epistemological styles were fairly independent of each other, except for a relationship between relativism and evaluativism, as shown in Table 4. These results are consistent with Newman's (1993) findings. Two of the epistemological styles, absolutism and evaluativism, showed opposite relationships to academic measures. Absolutism was inversely related to semester standing, grade in writing classes, and verbal aptitude, whereas evaluativism was positively correlated with these measures, though in some cases the correlations were weak.

Figure 2 presents the average scores on the three scales measuring epistemological styles for men and women in first-year and upper-level classes. Students overall had low absolutism scores (an average of 42 out of 120), and moderate scores for relativism (average 73.6) and evaluativism (average 80.2). A 2×2 MANOVA crossing gender and class with scores on epistemological styles as dependent measures revealed a significant multivariate main effect of class, $F(1, 350) = 8.88, p < .0001$. Subsequent analyses revealed that upper-level students were significantly less absolutist than first-year students, $F(1, 350) = 17.21, p < .0001$. These results are consistent with previous research (Hays & Brandt, 1992; Hays et al., 1988; Newman, 1993; Perry, 1970). Upper-level students were also significantly more evaluativist than first-year students, $F(1, 350) = 4.39, p < .04$, but this difference became marginal ($p = .11$) when the analysis was repeated with SAT-V as covariate. No differences in relativism were detected.

These results are inconsistent with a linear stage model in terms of which one would expect the three scales to be strongly inversely related. In other words, first-year students did not seem to start out as predominately absolutist, then abandon these beliefs for relativism, which then gives way to evaluativism. Rather, both first-year students and upper-level students exhibited a complex mixture of styles in which the strength of absolutism seems to decline and the strength of evaluativism increases between first-year and upper-level groups.

Gender effects. The 2×2 gender by class MANOVA also produced a significant multivariate effect for gender, $F(1, 350) = 11.24, p < .0001$. Subsequent univariate analysis showed that women were significantly less absolutist than men, $F(1, 350) = 25.83, p < .0001$, as shown in Figure 2. Women were also more relativist than men, $F(1, 350) = 9.34,$

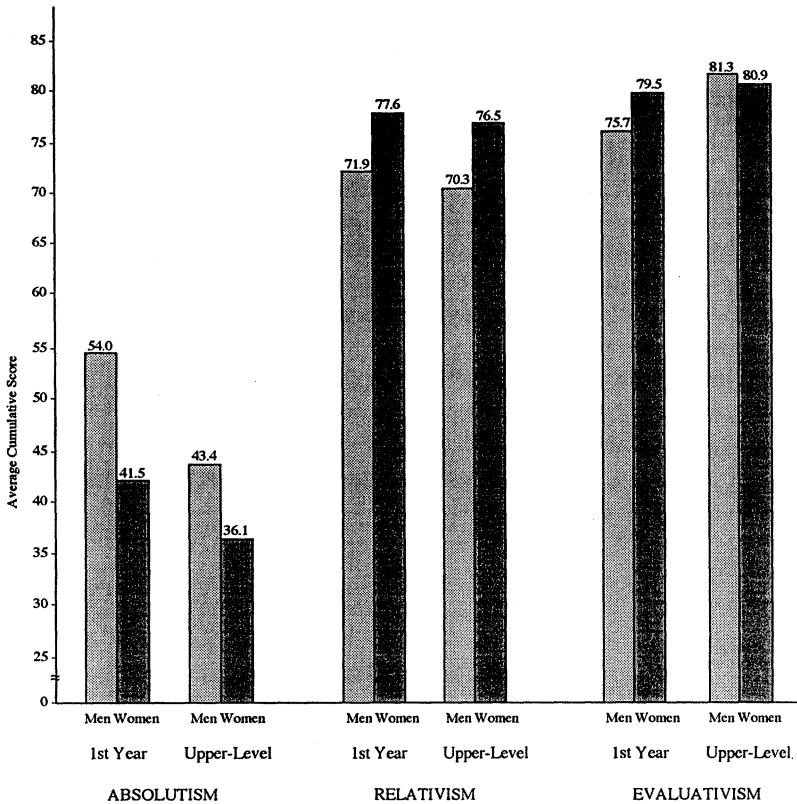


Figure 2: Average scores on epistemological scales for first-year men ($n = 50$), first-year women ($n = 37$), upper-level men ($n = 137$), and upper-level women ($n = 130$).

NOTE: Maximum score = 120.

$p < .002$, though this difference became nonsignificant when the analysis was repeated with verbal ability as covariate.

How epistemological styles vary by academic discipline. As shown in Figure 3, academic areas were associated with particular combinations of epistemological styles. A 4×2 MANOVA crossing academic discipline with gender produced a significant main effect of discipline ($F = 2.45, p < .009$), so follow-up univariate analyses were performed. Absolutism scores for upper-level students varied significantly depending on their academic fields, $F(3, 278) = 3.62, p < .014$. Humanities students had the lowest absolutism scores, and students in business

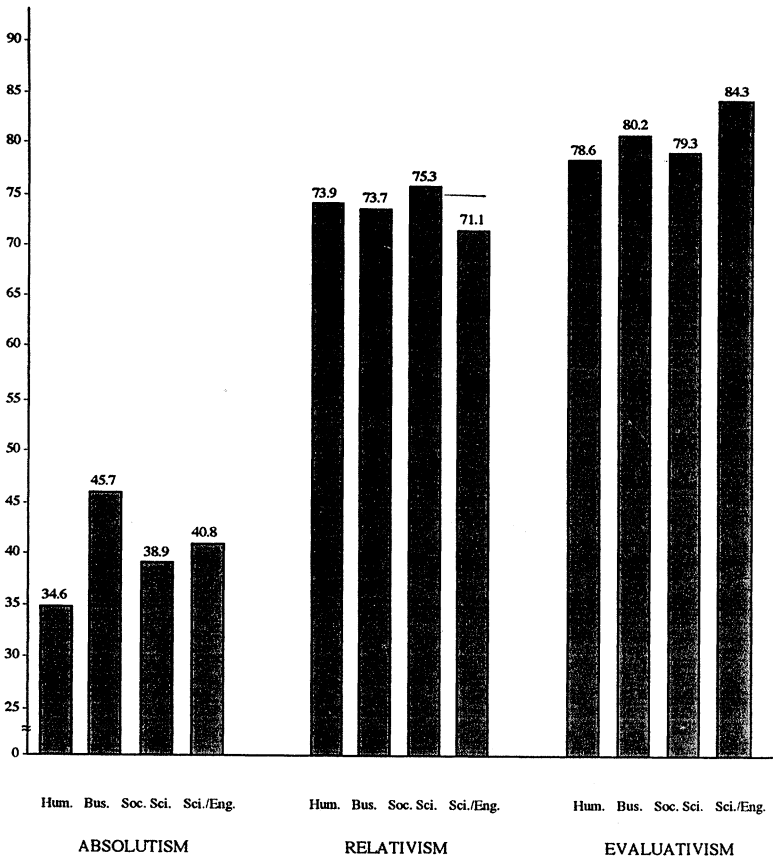


Figure 3: Average scores for upper-level undergraduates in absolutism, relativism, and evaluativism in four academic disciplines.
 NOTE: Maximum score = 120.

the highest; students in the social sciences and science/engineering had intermediate scores that were significantly different from humanities and business but not from each other (post hoc LSD comparisons, $\alpha = .05$). Relativism scores did not reliably differ across disciplines. Evaluativism was marginally different across these fields, with higher scores in science/engineering than in the other three areas, $F(3, 278) = 2.29, p = .079$.

As shown in Table 5, when differences in verbal ability (SAT-V) were partialled out, significant interactions emerged between gender

Table 5
Average Scores for Absolutism, Relativism, and Evaluativism^a by Gender in Four Academic Areas, With SAT-V Covariate

	Academic Area				Marginal
	Humanities ^b	Social Science ^c	Science/Engineering ^d	Business ^e	
Absolutism					
Women (<i>n</i> = 84)	31.7 (18.5)	33.4 (13.4)	39.1 (16.7)	45.3 (12.6)	36.6
Men (<i>n</i> = 99)	44.6 (18.8)	43.3 (15.6)	39.5 (13.5)	48.8 (16.9)	43.7
Marginal	37.8	36.4	39.4	47.5	
Relativism					
Women	72.1 (13.0)	82.1 (9.5)	68.8 (20.0)	76.7 (14.0)	76.0
Men	75.3 (16.1)	61.5 (29.6)	73.3 (14.2)	73.4 (15.4)	72.1
Marginal	73.6	75.9	72.0	74.6	
Evaluativism					
Women	75.1 (13.9)	82.8 (13.4)	81.0 (6.6)	82.2 (9.8)	80.5
Men	81.1 (13.3)	71.7 (20.8)	85.5 (12.2)	80.6 (12.4)	81.4
Marginal	77.9	79.5	84.2	81.2	

NOTE: Standard deviations are in parentheses.

a. Maximum score = 120.

b. *n* = 38 (20 women, 18 men).

c. *n* = 43 (30 women, 13 men).

d. *n* = 55 (16 women, 39 men).

e. *n* = 47 (18 women, 29 men).

and academic area ($F = 2.84, p < .003$). Univariate analyses found interactions for all three epistemological styles: absolutism, $F(3, 174) = 2.83, p < .04$; relativism, $F(3, 174) = 4.91, p < .003$; evaluativism, $F(3, 174) = 3.57, p < .02$. A post hoc analysis (LSD, $\alpha = .05$) was used to investigate the interaction. In the humanities, men were more absolutist than women, but they did not differ in relativism or evaluativism. In business, men and women did not differ from each other on any of the epistemological styles. In science and engineering, men had higher evaluativism scores than women, but they did not differ in absolutism or relativism. The biggest divergences between men and women were in the social sciences, where men and women differed

on all three scales: The men were more absolutist, less relativist, and less evaluativist than the women. Furthermore, the men in the social sciences were the least relativist of the men in the sample, and the women in the social sciences were the most relativist women. It may be that men and women are attracted to different subfields within the social sciences, which include education, psychology, sociology, anthropology, and history.

The Relationship of Writing Attitudes to Epistemological Styles

One of the primary questions we sought to answer in this study is whether attitudes about writing are associated with particular epistemological styles. For example, if one believes that assertions are either completely right or completely wrong, one might also see writing ability as a gift or trait that is either present or absent. On the other hand, if one believes, as highly evaluativist people do, that knowledge of the world is approached gradually through successive refinement and testing of theories, then one might take the same approach to actively working to improve one's skills.

To investigate whether students who were more absolutist had different attitudes toward writing than students who were less absolutist, we used a median split to identify high and low absolutist groups and examined the writing attitudes and grades of each group (Table 6). A MANOVA found a significant multivariate effect of absolutism ($F = 3.77, p < .005$). In univariate tests, students in the low absolutism group were marginally more likely to see writing as learnable, $F(1, 340) = 3.04, p = .08$, and significantly more likely to enjoy writing, $F(1, 340) = 5.96, p < .02$, and to earn higher grades in writing classes, $F(1, 340) = 8.13, p < .005$. When the analysis was repeated with SAT-V as a covariate, the difference for learnability remained stable, but the differences for enjoyability and grades became nonsignificant.

A similar MANOVA on high and low evaluativist groups (Table 6) also found a significant multivariate effect ($F = 4.27, p < .002$). As univariate analyses revealed, students in the high evaluativist group were significantly more likely to see writing as learnable, $F(1, 344) = 7.48, p < .007$, to enjoy writing, $F(1, 344) = 6.09, p < .02$, to assess themselves as good writers, $F(1, 344) = 5.39, p < .02$, and to earn higher grades in writing classes, $F(1, 344) = 7.00, p < .009$. When SAT-V scores were included as a covariate in a repetition of the analysis, the differences in enjoyment and self-assessment remained stable. How-

Table 6
Average Scores on Writing Attitude Scales^a and Writing Course Grades^b for Students Grouped by Median Splits on Absolutism and Evaluativism

	Absolutism		Evaluativism	
	Low (<i>n</i> = 171)	High (<i>n</i> = 171)	Low (<i>n</i> = 108)	High (<i>n</i> = 112)
Enjoyment of writing	16.5 (5.6)	15.1 (4.9)	15.2 (5.0)	16.6 (5.5)
Belief that writing is learnable	20.9 (3.7)	20.2 (4.0)	19.9 (3.8)	21.0 (3.8)
Self-assessment of writing ability	17.7 (5.0)	17.2 (4.7)	17.0 (4.6)	18.2 (5.0)
Writing course grade	3.18 (.78)	2.94 (.81)	2.94 (.85)	3.17 (.75)

NOTE: Standard deviations are in parentheses.

a. Maximum score = 28.

b. Four-point scale.

ever, attitudes about the learnability of writing became marginal ($p = .08$) and the difference in grades became nonsignificant. Median splits on relativism showed no group differences.

One of our a priori hypotheses was that absolutism and beliefs about learnability might interact to affect writing achievement. Using a median split procedure, we crossed high and low absolutism with high and low belief in the learnability of writing to investigate the effect of these factors on grades (Table 7). The interaction between these factors was only marginally significant ($p = .11$); low absolutism combined with a strong belief that writing is learnable produced only a slight indication of disproportionately higher grades. This analysis again indicates that students in the low absolutism group earned significantly higher grades than students in the high absolutism group, $F(1, 345) = 10.10$, $p < .002$. However, in this comparison, students who believed writing is learnable earned marginally higher grades than students in the low learnability group, $F(1, 345) = 2.95$, $p = .09$. This small difference had not been found when learnability's effect on grades had been examined in relation to class or self-assessed ability. When verbal aptitude was included as a covariate in the analysis, the interaction and the main effect of absolutism became nonsignificant, but the effect of learnability on grades strengthened (though it remained marginal, $p = .06$).

Table 7
*Average Grades in Writing Classes^a for Students Grouped
 by Crossing Median Splits on Absolutism and Learnability*

	Absolutism		
	Low (<i>n</i> = 175)	High (<i>n</i> = 174)	Marginal
Belief in writing as learnable			
Low	3.04 (.86)	2.91 (.86)	2.97
High	3.33 (.68)	2.92 (.81)	3.13
Marginal	3.19	2.91	

NOTE: Standard deviations are in parentheses.

a. Four-point scale.

In sum, attitudes toward writing seem to be influenced by beliefs about knowledge. Students with less absolutist or more evaluativist epistemological styles have more positive attitudes toward writing. We must temper our interpretation of these results with the recognition that students' attitudes toward writing and their performance in writing classes are related to their verbal aptitude. Further research is required to tease apart the contributions of these different factors.

CONCLUSIONS

The goal of this study was to integrate and extend two strands of research, one on attitudes toward writing ability and the other on beliefs about knowledge. Apart from replications of earlier studies on attitudes and epistemologies, three major findings emerged from this study:

- Some epistemological styles were associated with higher writing grades, an effect that was mediated by higher verbal aptitude. Further, self-assessed writing ability was also associated with grades, although the effect is again confounded with verbal aptitude.
- Students in various academic disciplines differed in epistemological style and in some attitudes toward writing.
- Some epistemological styles were associated with particular attitudes toward writing.

Epistemological style, attitudes, and performance in writing classes. Among the epistemological styles, absolutism was negatively correlated with both grades and verbal aptitude, whereas evaluativism was weakly but positively correlated with grades and verbal aptitude. It is also important to note that the influences of writing attitudes and epistemological styles were independent of each other. They do not appear to have been mutually reinforcing in their impact on performance.

Although the effects we found on performance in writing classes were mild and strongly mediated by verbal aptitude, they are consistent with those of other researchers. Shell, Murphy, and Bruning (1989) were able to predict students' reading achievement scores from the degree of importance they assigned to reading ability and their scores on self-efficacy measures. Schommer (1990) found that students who believed that learning should be quick and easy drew overly simplified conclusions from a passage and that students with absolutist epistemologies leaped to more certain conclusions than the evidence in the passage warranted. Obviously, we cannot claim that attitudes and beliefs are the major factor underlying students' performance on writing tasks or in writing classes. However, these results do suggest that attitudes and beliefs affect what students consider important to do when they read and write and that these priorities affect their achievement. More effort to take account of students' attitudes and beliefs seems warranted.

Disciplinary differences. We found that students across academic disciplines differed in both attitudes toward writing and epistemological styles. In particular, humanities students enjoyed writing most and had the lowest scores in absolutism of all students; men in the humanities were more absolutist than women. Business students had the highest scores in absolutism, both for men and women. Science/engineering students enjoyed writing least, but received grades as good or better than other students; their SAT-V scores were higher than other groups. In addition, their scores in evaluativism were marginally higher than other groups, primarily because of the high scores of the men. Social sciences students did not stand out from the other groups on writing attitudes or epistemologies overall, but the men and the women in these fields were the most different from each other. The men were more absolutist, less relativist, and less evaluativist than the women. In fact, these men were the least relativist and the women were the most relativist of all groups.

The finding that epistemological styles vary across disciplines is consistent with other research indicating that upper-level undergraduates adopt standards for evaluating writing that are more like professionals in their prospective fields than like students in other disciplines (Charney et al., 1992). Although disciplinary differences did not emerge in Hays and Brandt's (1992) study, this may have been due to small sample populations in each area. The psychological literature on vocations has long suggested that personality characteristics are shaped or socialized by both educational and work environments (Holland, 1973). Indeed the socialization process that occurs during the period of career choice and development has been characterized by some psychologists (such as Super, 1957) as the *implementation of a self-concept*. However, it is clearly beyond our scope here to determine whether differences in epistemological styles across disciplines result from the socializing effects of courses in an academic major, whether they reflect the attitudes or skills that lead students to select a particular major (or profession), or whether both factors play some role.

The finding that students in various academic disciplines differ in their attitudes and epistemologies has implications for teaching writing across the curriculum. More research is required to address the effects of separating students by discipline in writing courses. It may be that staying within a disciplinary group reinforces that group's attitudes and beliefs. Alternatively, it may be pragmatically easier to tailor instruction to a more homogeneous group.

Relationships between epistemological style and attitudes toward writing. We speculated at the opening of this article that certain epistemologies might be associated with more or less productive attitudes toward writing. We found that students with either low absolutism scores or high evaluativism scores were more likely to see writing as learnable rather than as a gift. We also found that students with high evaluativism scores were also more likely to enjoy writing and to assess themselves as good writers. However, we saw no evidence that epistemological styles, such as absolutism, interacted with writing attitudes to differentially influence writing performance.

Changes in epistemological style. Another important result of this study is the replication of earlier findings from Newman (1993) that epistemological development does not proceed in linear stages; instead, students exhibit a complex mix of styles that changes over the college years. The cause of these changes cannot yet be determined; although it seems plausible that a college education helps to produce

such changes, they may also be due to maturation or self-selection. One series of related studies suggests that maturity alone does not lead to stronger evaluative cognitive skills. Kuhn et al. (1988) studied the ability to assess evidence appropriately, a skill that increases through the college years. This skill may well be associated with evaluativism, one component of which is belief in the appropriate assessment of the validity of evidence. Kuhn and her colleagues found that participants of all ages had some tendencies to ignore evidence that contradicted their prior beliefs or to misinterpret that evidence to make it seem consistent with *a priori* theories. However, subversion of evidence was significantly less common among adults than children. In one study, Kuhn's group investigated whether this effect could be attributed solely to age. They tested average adults who had not attended college, graduate students who were the same age as the average adults, college students, and high school students. The college students and graduate students were the least likely participants to interpret evidence in biased ways. The reasoning patterns of the adults who had not attended college were like those of high school seniors. The college and graduate students may have been better at these tasks than average adults because the selection and attrition processes in higher education favor those with more ability at critical reasoning. It is also highly plausible that the methods and goals of higher education encourage students to question absolute claims and to judge evidence more objectively.

More research is needed on the mutability of students' attitudes and epistemologies and whether instruction in one influences the other. Although we found that attitudes and epistemologies did not interact in their influence on writing grades, it may still be the case that instruction that promotes certain beliefs about knowledge will also affect attitudes toward learning. Kuhn et al. (1988) have advocated instruction in bracketing one's theories to allow more objective consideration of both theories and evidence. In particular, they have argued for active learning strategies that draw students' attention to their own behavior when using evidence to support theories. In a related vein, Penrose and Sitko (1993) have recently produced a collection of practices for the writing classroom that explicitly treat writing as a learnable skill and that promote active learning strategies for reading and writing processes. The effect of such practices on attitudes and beliefs has not yet been explored. Direct instruction in active learning strategies for reading and writing may not only help

students see writing as learnable but also influence other attitudes or lessen tendencies to absolutism.

Our most important finding, we believe, is that students' attitudes toward writing are not completely unrelated to their epistemologies. How students think about writing and about the nature of knowledge deserves further attention.

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Davida Charney, an associate professor of English at Penn State, studies scientific and technical discourse: the features that distinguish effective from ineffective texts and the processes that scientists use in reading and writing their literature. Her recent work includes a study of how students use model texts to write in a new scientific genre (Research in the Teaching of English), a study of the reading processes of scientists

and graduate students (Understanding Scientific Prose, edited by Jack Selzer), and an analysis of how hypertext affects reading and writing (Literacy and Computers, edited by Susan Hilligoss and Cynthia Selfe).

John H. Newman, an assistant professor of psychology at Mount St. Mary's College, studies lifespan cognitive development and issues of methodology and measurement related to this process. His research addresses the developmental changes of intellectual and ethical judgment during late adolescence and young adulthood. He has developed a measure of epistemic style and investigated how epistemic style influences the structure of conversation. He also studies late-life intellectual creativity, wisdom, philosophic maturity, and the interaction of mature scientists with young scientists in producing cognitive benefits for both.

Mike Palmquist is an assistant professor of English at Colorado State University, where he codirects the Center for Research on Writing and Communication Technologies. His research interests include the effects of computer and network technologies on writing instruction, the use of hypertext/hypermedia in instructional settings, and the impact of student attitudes about writing on writing performance. His work has appeared in Computers and Composition, Written Communication, IEEE Transactions on Professional Writing, and Social Forces, as well as in edited collections. He is currently coauthoring a book with Kate Kiefer about teaching writing in computer-supported classrooms.