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ABSTRACT

According to self-efficacy theorists, people's judgments of what they can accomplish are influential arbiters in human agency and, as such, powerful determinants of their behavior. In large part, this is because these self-efficacy beliefs are said to act as mediators between other acknowledged influences on behavior, such as skill, ability, previous accomplishments or subsequent performance. Path analysis was used to test the influence of writing self-efficacy, writing apprehension, perceived usefulness, and writing aptitude on the essay-writing performance of 218 fifth-grade students. A model that also included sex (gender) accounted for a 64% variance. Instruments were group administered in individual language arts classes during two periods. During the first period, students were asked to complete the self-efficacy, perceived usefulness, and apprehension instruments. During the second class period, students were asked to write the performance measure, a 30-minute essay. As hypothesized, self-efficacy beliefs made an independent contribution to the prediction of performance despite the expected powerful effect of writing aptitude. Aptitude also had a strong direct effect on self-efficacy. Self-efficacy had direct effects on apprehension and perceived usefulness. Girls and boys did not differ in performance, but girls reported higher writing self-efficacy, found writing more useful, and had lower apprehension. Results support the hypothesized role of self-efficacy in A. Bandura's social cognitive theory. (Contains 2 tables of data, a figure, and 43 references.) (Author/TB)

Running head: Writing self-efficacy

PREDICTIVE UTILITY AND CAUSAL INFLUENCE OF THE WRITING SELF-EFFICACY BELIEFS OF ELEMENTARY STUDENTS

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Abstract

Path analysis was used to test the influence of writing self-efficacy, writing apprehension, perceived usefulness of writing, and writing aptitude on the essay-writing performance of 218 5th grade students. A model that also included sex accounted for 64% of the variance in performance. As hypothesized, self-efficacy beliefs made an independent contribution to the prediction of performance despite the expected powerful effect of writing aptitude. Aptitude also had a strong direct effect on self-efficacy, which mediated the indirect effect of aptitude on performance. Self-efficacy had direct effects on apprehension and perceived usefulness. Girls and boys did not differ in performance, but girls reported higher writing self-efficacy, found writing more useful, and had lower apprehension. Results support the hypothesized role of self-efficacy in A. Bandura's (1986) social cognitive theory.

PREDICTIVE UTILITY AND CAUSAL INFLUENCE OF THE WRITING SELF-EFFICACY BELIEFS OF ELEMENTARY STUDENTS

According to self-efficacy theorists, people's judgments of what they can accomplish are influential arbiters in human agency and, as such, powerful determinants of their behavior (Bandura, 1986, in press). In large part, this is because these self-efficacy beliefs are said to act as mediators between other acknowledged influences on behavior--such as skill, ability, or previous accomplishments--and subsequent performance. The process of creating and using beliefs is simple enough and rather intuitive: individuals engage in a behavior, interpret the outcomes of their actions, use the interpretations to develop beliefs about their capability to engage in subsequent behaviors in the same domain, and behave in concert with the beliefs created. In school, for example, the beliefs that students develop about their academic capabilities help determine what they do with the knowledge and skills they possess. As a result, other influences on their academic performances are in large part the result of what students actually come to believe that they can accomplish. This helps explain why students' academic outcomes may differ markedly when they have similar ability.

Students develop their beliefs of personal efficacy from varied sources, including the observations they make of others attempting similar tasks or the verbal messages they receive from teachers, parents, and classmates. By far the strongest source of efficacy information, however, is that which students obtain from the interpreted results of their efforts. These previous results are themselves obviously strong predictors of subsequent efforts, but because "people's perceptions of

their efficacy touch, at least to some extent, most everything they do" (Bandura, 1984, p. 251), self-efficacy beliefs also predict academic performances and are important motivational factors.

Self-efficacy beliefs affect what students do by influencing the choices they make, the effort they expend, the persistence and perseverance they exert in the face of adversity, and the anxiety they experience. Believing that they are capable writers, for example, will serve students well when attempting an essay, not because the belief itself increases writing competence, but because it helps create greater interest in writing, more sustained effort, and greater perseverance and resiliency when obstacles get in the way of the task. When students have confidence in their capability to write an essay, they will also feel less apprehensive about writing. For these reasons, Bandura (1984, 1986) described self-efficacy as a mediating mechanism of personal agency--mediating between the influences that are the sources of its creation and subsequent behavior. Affective factors, such as the anxiety associated with specific academic areas, and attitudes, such as how useful students consider the task itself, are considered common mechanisms of personal agency. Like self-efficacy beliefs, they also influence academic outcomes. But, Bandura (1986) argued, the influence of these common mechanisms on academic performances is primarily due to the sense of confidence with which students approach academic tasks.

Both the predictive and mediational roles of self-efficacy have received support from a growing body of findings from diverse fields (see Multon, Brown, & Lent, 1991, for meta-analysis of research on the relationship between self-efficacy beliefs and academic outcomes). One academic area that has received little attention from self-efficacy researchers, however, is that of written composition. This is an unfortunate omission, given the important role that writing skills play at all levels throughout the academic curriculum. Moreover, what few studies have been

conducted have primarily been correlational. More complex analyses with which to test hypothesized relationships--such as path analyses--have not been conducted. Moreover, investigations have generally involved high school students and college undergraduates. Researchers have recommended that such studies be conducted at lower academic levels, especially at those in which these sorts of self beliefs are taking root (Bandura, 1989; Pajares & Johnson, in press; Reyes, 1984; Schunk, 1991).

Beliefs About Writing

Researchers in the field of composition who have investigated the cognitive processes that writers engage in as they compose text have primarily attempted to understand the thought processes underlying students' compositions (e.g., Emig, 1979; Flower & Hayes, 1981; Scardamalia, Bereiter, & Goelman, 1982; and see Faigley, 1990; Hairston, 1990). The more that researchers have learned about the relationship between cognition and writing, the more complex the relationship seems to be (Hull & Rose, 1989). Some researchers have addressed this complexity by investigating the affective factors involved in writing (e.g., Beach, 1989; Elbow, 1993). Faigley, Cherry, Jolliffe, and Skinner (1985) concluded that attitudes and beliefs play a key role in writing. In particular, Beach (1989) suggested that self-efficacy offered a particularly promising avenue of research for informing writing instruction.

Researchers who have explored the effect of self-efficacy beliefs on writing agree that the two variables are related (e.g., McCarthy, Meier, & Rinderer, 1985; Pajares & Johnson, 1994, in press; Shell, Colvin, & Bruning, 1995; Shell, Murphy, & Bruning, 1989). For example, Meier, McCarthy, and Schmeck (1984) reported that writing self-efficacy predicted the writing performance of college students, but they did not explore the nature of the relationships among

variables such as self-efficacy, apprehension, aptitude, and performance. McCarthy, Meier, and Rinderer (1985) identified 19 writing skills and asked undergraduates whether they could demonstrate them. They also assessed anxiety, locus of control orientation, and cognitive processing. In two studies conducted with the same students, self-efficacy--the confidence that students had in their writing skills--was related to holistically scored essay scores on the first study; self-efficacy and writing anxiety correlated with essay scores on the second. The relationship between self-efficacy and essay scores was moderate (.33).

Shell et al. (1989) also investigated the writing self-efficacy of undergraduates and reported a significant correlation between students' confidence in their writing skills and their holistic score on a 20-minute essay (.32). They did not find a significant relationship between the students' perceived usefulness of writing and their essay scores (.13). Pajares and Johnson (1994) reported that writing self-efficacy (.53), perceived usefulness (.55), and previous writing achievement (.57) correlated with the writing performance of undergraduates. However, in a multiple regression model that accounted for 68% of the variance in writing performance, only the students' self-efficacy and aptitude were significant predictors. In another study, Pajares and Johnson (in press) explored the writing self-efficacy of high school students and reported that both aptitude and self-efficacy beliefs had strong direct effects on performance. Although girls and boys did not differ in aptitude or performance, girls had lower confidence in their writing skills.

As we have already noted, Bandura (1986) argued that the anxiety students experience about an academic endeavor is in large part determined by the confidence they bring to that endeavor, for it is only when people believe they cannot control events that they have reason to fear them. Students confident of their writing capabilities experience less apprehension when

faced with a writing assignment than do students who believe they are poor writers. Efficacy beliefs predict "how well people cope with threats and how much fear arousal they experience" (p. 321). Empirically, this means that self-efficacy should continue to predict related academic performances when the effects of anxiety are controlled, whereas the effect of anxiety should diminish or disappear when self-efficacy judgments are controlled.

The term writing apprehension was first used by Daly and Miller (1975a) to describe a form of writing anxiety and has since been the focus of numerous studies. Daly and Miller (1975b) reported significant correlations between apprehension and SAT-verbal scores (.19), perceived likelihood of success in writing (.59), and willingness to take additional writing courses (.57). They also found that males were more apprehensive about writing than were females. But findings on the relationship between writing apprehension and writing have been inconsistent. Faigley, Daly, and Witte (1981) found the relationship significant when writing is assessed using standardized test results but not when an essay is used (only one of two samples was significant). McCarthy et al. (1985) did not find a relationship between apprehension and performance in the first of her studies.

The purpose of this study was to test the predictive and mediational role of the writing self-efficacy of elementary school students using path analysis with a model containing variables that have been found related to writing competence. Specifically, our aim was to determine whether the confidence with which 5th grade students approach writing an essay made an independent contribution to the prediction of a holistically scored essay score when writing apprehension, perceived usefulness of writing, writing aptitude, and sex are part of the model. The analysis also

tested whether self-efficacy mediates the effect of prior determinants--writing aptitude and sex--on apprehension, perceived usefulness, and writing performance.

Controlling for writing aptitude provides a particularly stringent test of the predictive value of self-efficacy judgments, given that aptitude assessments are highly predictive of academic beliefs and attitudes and are generally acknowledge to be the strongest predictor of academic performances. Motivational and self-regulatory influences affect both prior and later performance attainments (Bandura, 1986, in press). As a consequence, controlling for previous performance with aptitude assessments controls not only for aptitude but also for the prior impact of motivational determinants such as self-efficacy or anxiety on aptitude. These confounding influences are not easily disentangled, hence they should be kept in mind as results are interpreted.

Methods and Data Source

Participants and Procedures

Participants were 218 5th grade students in three public elementary school (two in the South and 1 in the Southwest). There were 115 girls, and 103 boys. Instruments were group administered in individual language arts classes during two periods. During the first class period, students were asked to complete the self-efficacy, perceived usefulness, and apprehension instruments. Directions and individual items were read aloud by the administrator. During the second class period, students were asked to write the performance measure--a 30-minute essay. Procedures were similar to those used by writing self-efficacy researchers (see, for example, Pajares & Johnson, 1994, in press; Shell et al., 1989, 1995). Instruments were as follows:

Writing performance. Consistent with procedures established by Shell et al. (1989), we asked students to write a 30-minute essay entitled "My Idea of a Perfect Day." Essays were scored

using holistic scoring, which has been found the most reasonable means of writing assessment, and, when standardized procedures are followed, provides consistent results (Hillocks, 1986). A 5-point scale was used. Clearly, assessing students' writing is not an objective task. It involves an inference by the reader of the quality of a written work, and such inferences may include biases and interpretations that can make the assessment an imperfect reflection of actual writing ability. Nonetheless, researchers in the field of composition believe that timed, in-class writing samples provide reliable assessments (Foster, 1983; Shell et al., 1989, 1995). Holistic scoring by expert readers provides reliable means to assess writing performance, is subject to interrater reliability checks, and, when standardized procedures are followed, provides consistent results (Hillocks, 1986). Consequently, essays were scored by one of the researchers and a second expert reader using holistic scoring with a 5-point scale (see guidelines prescribed by Wolcott, 1989). Scorers were unaware of student identities. One of the scorers is a professor of education who spent 12 years as a teacher of English composition; the second scorer is a professor of elementary education with 20 years of previous experience as a teacher of composition. Consistent with guidelines of social cognitive theory, criteria for scoring were the same as those on which students were asked to assess their writing self-efficacy, i.e., in terms of students' demonstration of grammar, usage, composition, and mechanical skills. When scorers' judgments differed, a student's final score was the average score. Interrater reliability was .87, which is within the range of interrater reliability estimates obtained for holistic scoring (.68 to .89) when adequate methods are used (White, 1985).

We operationalized writing self-efficacy as students' judgments of their confidence that they possess various composition, grammar, usage, and mechanical skills. The Writing Skills Self-Efficacy scale was developed by Shell et al. (1989) and consists of 8 items that ask students

to rate their confidence that they can perform writing skills such as "correctly punctuate a one page passage" or "organize sentences into a paragraph so as to clearly express a theme." Students may provide any score from 0 to 100 as a measure of their confidence in each skill. Shell et al. reported reliability scores of .95 for the scale in a study of undergraduates, and factor analysis showed positive and above .40 correlations between items and scale scores. Pajares and Johnson (in press) reported .91 with high school students. Shell et al. (1995) reported a coefficient alpha reliability of .76 using a similar instrument with a 7-point Likert scale. We obtained a Cronbach's alpha coefficient of .88 and positive and above .68 correlations between items and scale scores.

Writing apprehension describes "a person's tendencies to approach or avoid situations perceived to potentially require writing accompanied by some amount of perceived evaluation" (Daly & Wilson, 1983, p. 327). We adapted Daly and Miller's (1975) Writing Apprehension Test (WAT), a 26-item instrument used extensively and regarded a reliable measure of writing anxiety (sample item: "I am afraid of writing essays when I know they will be evaluated.") Reed, Burton, and Vandett (1988) found the WAT reliable but suggested that the uncertain item be removed from the 5-point scale. We reduced the 26-item instrument to 9 items for ease of administration with elementary school students, increased the Likert scale to 8 points in accordance with social cognitive guidelines (see Bandura, in press), and obtained an alpha coefficient of .83. Using a similar scale with high school students, Pajares and Johnson (in press) obtained a Cronbach's alpha coefficient of .93. Exploratory factor analysis revealed that each item loaded above .45 on a single factor. We regard the modest loss of reliability to be primarily due to the age of the students in the sample rather than alteration of the scale (see Pajares & Urdan, 1996, for similar results with math anxiety).

The Perceived Usefulness of Writing scale was adapted from the Writing Outcome Expectations Scale (Shell et al., 1989). It consists of 10 items that assess students' judgments of the importance of writing for successfully accomplishing various academic and life endeavors such as making a good living, getting good grades, or getting a job. Shell et al., reported a Cronbach's alpha coefficient of .93 and positive and above .40 item/total correlations for all items on the original scale used with undergraduates. We obtained an alpha coefficient of .84 and similar factor loadings with our elementary school sample.

Teacher ratings of students' writing aptitude is acknowledged as a reliable assessment of writing assessment level (see Hoge & Butcher, 1984). This assessment was made by the students' language arts teachers toward the end of the first semester, after they had become familiar with their students' writing. We again alert the reader to the conceptual and empirical similarity between aptitude and performance assessments and to the particularly stringent test of the predictive value of cognitive/affective judgments that the inclusion of such an assessment provides.

Data Analysis

Path analysis techniques are used to examine direct and indirect effects between variables, thus enabling causal inferences to be made, if modestly and cautiously. In essence, such analyses "allow us to move beyond simple or multiple correlations to testing the causal ordering of these variables that is hypothesized on the basis of self-efficacy theory" (Hackett, 1985, p. 50). Cook and Campbell (1979) suggested that they are especially appropriate when "theoretical, empirical, and commonsense knowledge of a problem" (p. 307) provides a defensible mapping of the variables in the model and their hypothesized links. Path analyses are, therefore, appropriate in

investigations in which the tenets of social cognitive theory and previous findings are such that hypothesized relationships have strong theoretical and empirical support.

We began the analysis by testing the goodness of fit of the theoretical model posited by social cognitive theory. Consistent with previous findings (e.g., McCarthy et al., 1985; Pajares & Johnson, 1994, in press; Shell et al., 1989) and based on social cognitive theory (Bandura, 1986), the initial theoretical model tested was as follows: Sex and writing aptitude were exogenous variables hypothesized to influence the endogenous variables; self-efficacy was hypothesized to influence apprehension, perceived usefulness, and performance; apprehension and perceived usefulness are considered common mechanisms of personal agency and were hypothesized to influence performance, but they were placed between self-efficacy and performance in the model due to theoretical considerations earlier explained. We refined this initial model by removing nonsignificant paths in the order suggested by the stepwise multivariate Wald test and retested each reduced model comparing goodness of fit indices (Bentler, 1990; Bentler & Chou, 1987). The final model reflects the results of this process (see Figure 1). Path analyses were conducted using the SAS system's CALIS procedure (SAS Institute, Inc., 1989). Prior to conducting the path analysis, sex differences on the variables in the study were also tested using a multivariate analysis of covariance (MANCOVA) using teacher ratings as the covariate.

Results

Table 1 presents the means, standard deviations, and Pearson-Product moment correlations for all variables in the study. The magnitude of the correlations between the independent variables and writing performance, as well as that between these variables and writing self-efficacy, was consistent with those of previous investigations. The correlation between self-efficacy and

performance was similar to those obtained by Pajares and Johnson (1994, in press) but higher than some previously been obtained. This was likely due to the correspondence between the self-efficacy items and the criteria for scoring the essays, a procedure recommended by social cognitive theorists (see Bandura, 1986; Pajares, 1996; Pajares & Miller, 1995). MANCOVA results revealed a significant univariate effect for sex, Wilks' lambda = .88, $F(4, 212) = 7.44$; $p < .0001$. There were sex differences on writing apprehension, $F(2, 215) = 20.06$, $p < .0001$, perceived usefulness, $F(2, 215) = 4.87$, $p = .009$, and writing self-efficacy, $F(2,215) = 18.84$, $p < .0001$. In each case, differences favored girls. Sex differences in writing performance were a function of previous aptitude.

Results of the structural equation modeling are presented in Figure 1. The final model yielded a nonsignificant χ^2 (6, $N = 218$) = 6.95, $p = .33$, a Goodness of Fit Index adjusted for degrees of freedom (AGFI) of .96, Normed fit index (NFI) of .98, and Non-normed fit index (NNFI) of .99. All are excellent indices of goodness of fit. The independent variables accounted for 64% of the variability in writing performance. Chi square differences demonstrated that the final model had significantly better fit than the initial model or than the reduced models tested when nonsignificant paths were removed.

In spite of the expected powerful effect of aptitude ($\beta = .601$), self-efficacy made an independent contribution to the prediction of writing performance ($\beta = .356$), and this resolves the substantive question of the study. The effect of self-efficacy on writing apprehension ($\beta = -.452$) and on perceived usefulness of writing ($\beta = .230$) suggested that, as Bandura (1986, in press) has suggested, common mechanisms of personal competence such as anxiety and perceived usefulness are in large part a by-product of efficacy perceptions. The direct effects of aptitude ($\beta = .311$) on

self-efficacy reveal that, as hypothesized, previous achievements are important sources of efficacy information. As foreshadowed by MANCOVA results, sex did not have a direct effect on performance, but there were direct effects from sex to perceived usefulness (β = -.152), to apprehension (β = .257), and to self-efficacy (β = -.173). These effects were consistent with results of the MANCOVA analysis showing that girls reported lower apprehension, greater self-efficacy, and perceived writing as more useful than did the boys.

Discussion

Our results demonstrate that elementary students' self-efficacy perceptions predict their writing performance and play the mediational role that social cognitive theory hypothesizes. Students' self-efficacy beliefs about their own writing capability directly influenced their writing apprehension, perceived usefulness of writing, and essay-writing performance and partially mediated the effect of sex and writing aptitude on their apprehension, perceived usefulness, and performance. As expected, aptitude also predicted writing performance, but it made no independent contribution to the prediction of apprehension or perceived usefulness.

These are striking findings in light of the powerful test of the influence of self-efficacy that inclusion of an aptitude assessment of this type provides in an investigation of academic performances (see Bandura, in press; Pajares & Kranzler, 1995). Recall that controlling for writing performance with previous aptitude that consists of teacher judgments of pupil achievement is potentially problematic because scores on such assessments are partially composed of affective factors. Bandura (in press) cautioned that motivational and self-regulatory influences affect both prior and later performance attainments. As a consequence, controlling for past performance by using assessments of academic aptitude in the target subject controls not only for

that aptitude but also for the prior impact of motivational determinants and self-beliefs such as self-efficacy or apprehension. The result is that the influence of affective factors such as self-efficacy on writing performance is potentially greater than the path obtained indicates.

Results from this investigation are especially noteworthy when contrasted with those obtained by Pajares and Johnson (in press), who investigated the writing self-efficacy of entering high school students. Pajares and Johnson reported that 9th grade boys and girls did not differ in writing performance, but the boys reported higher self-efficacy. We also found no differences in performance, but the 5th grade girls in our study reported higher self-efficacy, lower apprehension, and perceived writing as more useful. It may be that, at elementary school levels, girls have more positive self beliefs about writing and express greater confidence in themselves as writers but that this confidence erodes as they progress through school despite no corresponding changes in writing competence. If this is so, it would be consistent with conclusions made by math self-efficacy researchers in the area of mathematics (e.g., Hacket & Betz, 1989).

Shell et al. (1995) reported sex differences in writing self-efficacy but did not detect an interaction of sex and level using separate 4th grade, middle school, and high school samples. A longitudinal study using the same cohort would help clarify these issues. Nonetheless, sex differences of any sort in self-beliefs that do not correspond to differences in academic performance are differences in belief only. Whether boys have lower self-efficacy early or girls have lower self-efficacy later or any particular group has lower self-efficacy at any time, it should in all cases be beneficial to alter inaccurate self-beliefs that are unrealistically low and do not correspond to academic skills. The effect of low self-efficacy beliefs may differ by sex and by

age, but they are likely to result in lessened effort, decreased persistence and perseverance, and lower optimism any time they are held (see Bandura, in press; Scheier & Carver, 1993).

Two implications emerge from our findings. If it is true that the writing self-efficacy of boys is lower during elementary school years and that the self-efficacy of girls erodes as they progress through school, teachers would be well advised to assess students' writing confidence as they do their writing competence. In fact, some self-efficacy researchers have suggested that teachers should pay as much attention to students' perceptions of competence as to actual competence, for it is the perceptions that may more accurately predict students' motivation and future academic choices. Assessing students' self-efficacy beliefs can provide teachers with important insights. For example, researchers have demonstrated that self-efficacy beliefs strongly influence the choice of majors and career decisions of college students (see Hackett & Betz, 1989). In many cases, inaccurate perceptions of ability, and not lack of skill, are responsible for avoidance of certain courses and careers. This phenomenon may be at work in the area of composition with students who have unrealistically low writing self-efficacy. If so, efforts to identify and alter inaccurate judgments should prove beneficial. And, if self-efficacy beliefs are a primary cause of variables such as writing apprehension, then interventions designed to improve writing by decreasing anxiety may be useful to the degree that they increase students' confidence in their writing ability.

The second implication is that, if efficacy beliefs perform the functions posited by social cognitive theory, teachers have the responsibility to increase students' competence and confidence as students progress through school. Bandura (1986) argued that

> educational practices should be gauged not only by the skills and knowledge they impart for present use but also by what they do to children's beliefs about their capabilities, which affects how they approach the future. Students who develop a strong sense of self-efficacy are well equipped to educate themselves when they have to rely on their own initiative. (p. 417)

Schunk and his associates have provided insights on how this can be accomplished (see Schunk, 1991).

We caution the reader to some limitations of our study. First, analyses on which inferences of causality are made are not without controversy (see Freedman, 1987). Although they provide powerful statistical tools with which to explore the nature of causal relationships in nonexperimental studies (see Bentler & Chou, 1987; Duncan, 1975), they are in large part at the mercy of the relationships hypothesized to exist before the model is constructed. As such, they reflect the theoretical orientation that undergirds a study and the researcher's interpretation of the theoretical directional interplay among the variables. In the case of this study, the theoretical orientation was Bandura's (1986) social cognitive theory. Interpretations must be made carefully and modestly. A replication using more powerful statistical tools to test competing theoretical models, such as structural equation modeling, and additional motivational variables would be a reasonable next step. If causal models are to be used, repeated measures and longitudinal designs would test the causal relationships more directly and permit interpretations of the reciprocal influence of self-efficacy beliefs and related academic outcomes.

Findings from this study strengthen Bandura's (1986) claim that self-efficacy beliefs play an influential role in human agency. In addition, the contrast of these results with those of Pajares

and Johnson (1994, in press) suggests that there may be developmental component to the creation and evolution of writing self-efficacy beliefs and that the predictive and mediational roles of self-efficacy may differ as a function of academic level and years of schooling. The implication that arises is that researchers and school practitioners should be looking to students' beliefs about their academic capabilities as important predictors of other affective variables and of academic performances and that efforts should be made to identify these beliefs, for they are important components of motivation and behavior. This is consistent with McLeod's (1987) observation that, because writing is as much an emotional as a cognitive activity, affective components strongly influence all phases of the writing process. She urged researchers to explore affective measures with an eye toward developing a "theory of affect" to help students understand how their affective processes may inform their writing. Given our findings, it seems warranted that students' self-efficacy perceptions should play a prominent role in such a theory.

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Table 1. Means, standard deviations, and zero-order correlations for variables in the Study by sex.

	Girls							Boys	
	M	SD	1	2	3	4	5	M	SD
1. Performance	3.17	1.08	--	-.31*	.25*	.53*	.69*	2.68	1.09
2. Apprehension	32.04	12.96	-.31*	--	-.21*	-.52*	-.21*	42.35	13.51
3. Perceived Use	65.05	10.66	.04	-.27*	--	.26*	.10	59.85	13.96
4. Self-efficacy	79.25	16.36	.56*	-.42*	.18*	--	.26	70.80	18.42
5. Aptitude	3.30	1.10	.73*	-.13	.06	.36*	--	2.86	0.99

Note: For sex, girls were coded 0 and boys were coded 1.

*$p < .05$

Table 2. Decomposition of Effects from the Path Analyses

Effect	Parameter Estimate	Std Error	Stdized Estimate	t	R^2
On writing self-efficacy					.14
of writing aptitude	5.18	1.07	.311	4.87	
of sex	-6.17	2.28	-.173	-2.71	
On perceived uselfulness					.09
of writing self-efficacy	0.16	0.05	.230	3.45	
of writing aptitude			ns		
of sex	-3.83	1.67	-.152	-2.29	
On writing apprehension					.33
of writing self-efficacy	0.36	0.05	-.452	-7.88	
of writing aptitude			ns		
of sex	7.28	1.63	.257	4.48	
On writing performance					.64
of writing apprehension			ns		
of perceived usefulness			ns		
of writing self-efficacy	0.02	0.00	.356	8.15	
of writing aptitude	0.62	0.05	.601	13.77	
of sex			ns		

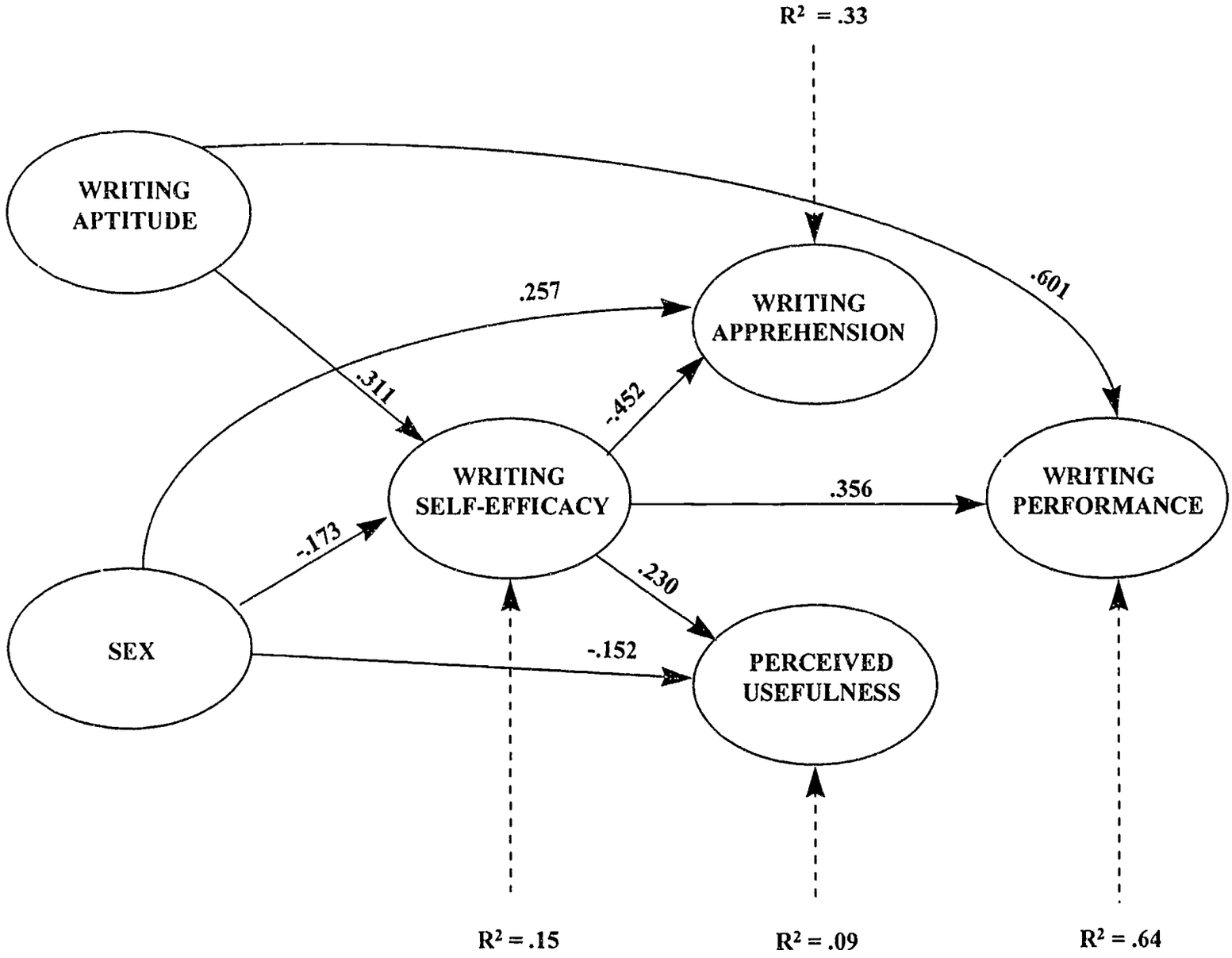

Figure 1 - *Significant path coefficients for variables in the study.*