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Relationships between writing motivation, writing activity, and writing performance: effects of grade, sex, and ability

Authors
Gary A. Troia • Allen G. Harbaugh • **Rebecca K. Shankland** • Kimberly A. Wolbers • Ann M. Lawrence

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G. A. Troia (&)
Department of Counseling, Educational Psychology, and Special Education, Michigan State University, 343 Erickson Hall, East Lansing, MI 48824, USA
e-mail: gtroia@msu.edu

A. G. Harbaugh
Murdoch University, Perth, WA, Australia

R. K. Shankland
Appalachian State University, Boone, NC, USA

K. A. Wolbers
University of Tennessee, Knoxville, TN, USA

A. M. Lawrence
Michigan State University, East Lansing, MI, USA

That motivation plays a prominent role in writing development and performance is acknowledged in most contemporary models of writing (e.g., Hayes, 1996; Zimmerman & Risemberg, 1997). Composing tasks often are inherently difficult for the writer because they tax numerous lower- and higher-order psycholinguistic processes that are situated within a dynamic motivational state. Because writing is a relatively high-cost activity in terms of effort, a positive motivational stance may be difficult to attain (e.g., Hidi & Anderson, 1992). How authors motivate themselves differs widely, but motivation is presumably a necessary ingredient for attaining writing success (Pintrich & Schunk, 2002; McLeod, 1987). However, motivation is not a unitary construct, but rather is comprised of several related components, including self-efficacy beliefs, interest, perceived task value, attitudes, goal orientations, and attributions for success and failure. Also, there are potentially important mediators and moderators of the relationship between these motivation components and writing, as well as measurement issues that can obfuscate relevant and important findings.

Components of motivation for writing

Self-efficacy, an individual's assessment of his or her competence to perform a future task, is perhaps the most well established and well researched aspect of human motivation (Bandura, 1997). Generally speaking, measures of self-efficacy are positively related to the amount of effort expended to perform a task, persistence with a difficult task, the recruitment of strategies to accomplish a task, and actual task performance, regardless of one's age, sex, or ethnicity (e.g., Bandura, 1997; Pajares, 1996b; Pintrich & DeGroot, 1990; Pintrich & Schunk, 2002). Self-efficacy beliefs comprise both outcome expectations, which are beliefs that particular actions will lead to desired outcomes, and efficacy expectations, which are beliefs that one is capable of performing those actions to achieve goals (Bandura, 1997; Eccles & Wigfield, 2002). For instance, one might believe an action will yield a particular result—revising a report several times for clarity and detail will produce a more polished and informative paper—but not necessarily that one can successfully perform the requisite action. With respect to writing, research has demonstrated that self-efficacy is significantly predictive of writing performance (e.g., Shell, Colvin, & Bruning, 1995; Shell, Murphy, & Bruning, 1989; Pajares & Johnson, 1994, 1996; Pajares, Miller, & Johnson, 1999; Pajares & Valiante, 1997, 1999).

In conjunction with self-efficacy beliefs, task interest and value influence the selection of goals and represent another core component of human motivation within expectancy-value theory (e.g., Hidi, Berndorff, & Ainley, 2002). Interest reflects, in part, the personal significance or value attached to a task (Wigfield & Eccles, 1992; Schiefele, 1999). Individuals with strong personal interest in a topic or activity will pay greater attention, persist longer, enjoy their involvement, and acquire more knowledge than those lacking interest (e.g., Schiefele, 1991). Interest

has been found to facilitate writing performance (see Albin, Benton, & Khramtsova, 1996; Benton, Corkill, Sharp, Downey, & Khramtsova, 1995), though it may be harder to promote interest in writing because it is a relatively higher cost task than reading, for instance (e.g., Hidi & Anderson, 1992).

Research suggests that values and self-efficacy beliefs initially may operate independently of each other and then gradually become related through operant conditioning and efforts to maintain positive self-beliefs (Eccles, Wigfield, & Schiefele, 1998; Wigfield et al., 1997). As an example, task value may be diminished if an individual's self-efficacy beliefs for a task are low as the writer seeks to preserve self-concept and self-esteem (e.g., Eccles et al., 1993). Shell et al. (1989) found that perceived confidence in writing (i.e., writing self-efficacy) and holistic essay scores were significantly correlated, but perceived value of writing and essay performance were not related. Likewise, Pajares et al. (1999) found that writing self-efficacy alone, but not writing self-concept, perceived value, apprehension, or self-efficacy for self-regulation, made an independent contribution to predicting essay writing performance in children in grades 3 through 5. At this time, the particular causal pathways between self-efficacy, interest, and value are not well understood: perceived competence may lead to increased value and interest, or vice versa (Bandura, 1997; Hidi et al., 2002; Eccles et al., 1998; Linnenbrink & Pintrich, 2003; Wigfield et al., 1997; Zimmerman & Kitsantas, 1999). Research studies evaluating, in tandem, self-efficacy beliefs, task interest, and task value are needed.

Attributions reflect the perceived causes of success and failure (Weiner, 1986). They are influenced by the perceived amount of personal control over the cause, its locus, and its stability (Schunk, 1994; Weiner, 1986). When individuals attribute success to factors under their personal control, such as effort, and failure to either insufficient effort or unrealistic expectations (Weiner, 1986), they are more likely to exhibit an adaptive motivational pattern. That is, these persons are motivated to perform well because they anticipate that their effort expenditure will facilitate their performance. Conversely, when success is attributed to luck, task ease, or teacher assistance and failure is attributed to limited ability, all of which are factors not under personal control, a helpless motivational pattern is likely to emerge (Leggett & Dweck, 1987; Schunk, 1984). Persons exhibiting a helpless motivational pattern are less likely to be motivated to perform well because they believe their efforts have little impact on performance outcomes.

Adaptive attributions are related to, though conceptually distinct from, self-efficacy beliefs, and have an impact on persistence, choice, goals, strategic behavior, and achievement (Kalechstein & Nowicki, 1997; Weiner, 1986). Researchers have found that both effort and ability attributions are associated with high achievement (Schunk, 1984; Schunk & Cox, 1986) and that attributions become more rooted in ability than effort over time (Shell et al., 1995), as children's perspectives regarding the nature of ability and intelligence shift from incremental or malleable to more fixed and trait-oriented (Nicholls & Miller, 1984). Unfortunately, our understanding of the impact of attributions on writing performance is limited because this component of human motivation has been omitted in the extant research.

In the area of academic achievement, theory specifies two general kinds of goals: mastery and performance goals (Ames, 1992; Middleton & Midgley, 1997). Mastery

goals are associated with a focus on knowledge and skill attainment and achieving a sense of competence, whereas performance goals are associated with a focus on demonstrating relative ability, receiving public recognition, and surpassing others (Ames, 1992). More recently, performance goals have been separated into performance approach and performance avoidance goals (e.g., Senko, Hulleman, & Harackiewicz, 2011), reflecting the fact that one may desire to display competence to receive recognition, more positive evaluations, and a greater competitive edge (approach), or to avoid displaying incompetence (avoidance). However, approach and avoidance goals have not been adequately distinguished in some research (Middleton & Midgley, 1997; Urdan, 1997). Mastery goals are associated with many positive learning attributes, such as higher self-efficacy, greater self-regulation, and better achievement (e.g., Ames, 1992; Pintrich & DeGroot, 1990; Pintrich & Schunk, 2002). Performance approach goals are not necessarily maladaptive (e.g., Pajares, Britner, & Valiante, 2000), though it is unclear under what circumstances and for which students this may be the case (Midgley, Kaplan, & Middleton, 2001).

In the domain of writing, goal orientations and their relationship with other motivation constructs have not been thoroughly explored. One exception found that performance approach goals were positively associated with self-efficacy beliefs in 7th and 8th graders (Pajares et al., 2000). However, Elliott (1999) has hypothesized that self-efficacy beliefs may exert a direct effect on individuals' achievement goals, with higher perceived competence associated with an inclination to adopt mastery and performance approach goals and lower self-efficacy associated with a tendency to adopt performance avoidance goals.

Potential moderators of writing motivation

Sex

Sex differences favoring females have been reported in the literature for writing self-efficacy beliefs (e.g., Hidi et al., 2002; Pajares & Johnson, 1994, 1996; Pajares et al., 1999; Pajares & Valiante, 1997), perceived writing task valuation (Shell et al., 1995; Wigfield & Eccles, 1992; Pajares & Valiante, 1999), writing apprehension (Pajares et al., 2000), and writing achievement goals (Pajares et al., 2000). However, these differences, at least in self-efficacy, may diminish and even reverse direction by the time students reach high school (Pajares & Johnson, 1996), though this change may be due to relative differences rather than absolute differences. That is to say, adolescent females may be more modest in their estimations of task competence (perhaps because they view such estimations as a promise for performance) and/or adolescent males may overestimate their perceived competence (Noddings, 1996; Wigfield, Eccles, & Pintrich, 1996), both of which can mask or accentuate true differences. Nevertheless, when prior writing achievement is held constant, sex differences in self-efficacy are rendered non-significant (e.g., Pajares et al., 1999; Pajares & Valiante, 1999). The nature of and changes in sex differences for other components of writing motivation have not been explored in the extant literature.

Age/grade

Research suggests that, as students grow older, there is deterioration in their motivation to perform academic tasks. For instance, motivation in the domain of reading becomes less positive as students progress in school, as do attitudes towards reading (Eccles et al., 1998; Wigfield, Eccles, & Rodriguez, 1998; McKenna, Kear, & Ellsworth, 1995). Additionally, strong positive correlations between aspects of reading motivation (self-efficacy, task interest/value, and achievement goals) and self-reported reading behaviors have been observed in students in grades 4 though 6 (Baker & Wigfield, 1999; Wigfield & Guthrie, 1997): students with high degrees of motivation reported reading the most, while students with low levels of motivation reported reading the least. Thus, there appears to be an association between motivation and activity within a domain, which may change over time. In the domain of writing, Pajares and Valiante (1999) found that 6th graders reported stronger self-efficacy beliefs and greater perceived task value than 7th or 8th graders at the same school, even though the 8th graders were better writers based on teacher ratings and they themselves indicated they were better at writing than their peers in the 6th and 7th grades. Knudson (1991, 1992) found that attitudes towards writing tend to become less positive over time. Thus there is some limited evidence that writing motivation may diminish over time; however, no study to our knowledge has examined the relationship between writing motivation and writing activity, and how this may change as students progress in school from elementary school to high school.

Writing ability

Writing ability often is a criterion dependent variable in many studies of writing motivation, but prior writing ability also serves as a predictor of current writing performance, and thus operates as an independent variable as well. As an example, Pajares and Valiante (1999) found that self-efficacy beliefs and prior writing achievement (using English/language arts grades) were the only significant predictors (standardized beta weights of 0.19 and 0.50, respectively) of teachers' ratings of students' writing competence; writing apprehension, self-concept, perceived task value, and self-efficacy for self-regulation did not contribute significantly to the prediction of writing competence. According to Bandura (1997), when prior achievement in writing is used as a predictor of current writing performance, the prior impact of motivational determinants of writing performance also are captured by the measure of prior writing achievement. This is an important consideration when examining factors that influence writing motivation and performance.

Measurement issues in writing motivation: scale specificity and congruence

A key issue in measuring self-efficacy is the degree to which an instrument displays adequate item specificity (i.e., there is clear elaboration on which aspect of the domain is the focus of the item) and congruence with the criterion task to which self-efficacy predictions are made (Bandura, 1997; Pajares, 1996a). Pajares (1996a)

has argued that domain-specific omnibus measures of self-efficacy (e.g., a writing self-efficacy scale) may be problematic if a composite score is derived from items that represent different aspects of the domain (e.g., self-efficacy for writing tasks versus self-efficacy for writing skills). Moreover, if the criterion task is unclear to respondents, whatever predictive power is afforded by the motivation measure likely will be due to perceived similarities across varied tasks rather than a specific predictive relationship. However, a high degree of specificity and congruence does have its drawbacks—the relevance and validity of the measure may be reduced (Lent & Hackett, 1987). Thus, a measure that balances measurement precision with practical relevance and validity is most desirable, especially in the domain of writing which represents a broad array of competencies and tasks.

In summary, most studies of writing motivation have focused on a limited set of constructs associated with achievement motivation. Moreover, many of the studies reported above used relatively small samples ($N \setminus 100$), and those with large samples tended to target a narrow age range, which does not provide an adequate developmental perspective. Sex differences have been observed in some studies, but potential differences between males and females in many aspects of writing motivation have not been investigated. Writing activity (the amount and breadth of writing in which students engage) has not been explored as a potential contributor to or outcome of writing motivation and performance. Finally, there is a need to develop a writing motivation scale that (a) evaluates motivation within a multidimensional framework that bridges expectancy-value, achievement goal, and attribution theories, (b) measures motivation constructs with adequate precision, and (c) possesses acceptable specificity and congruence without compromising predictive utility across varied writing tasks and skills. This study addresses these limitations using such a scale. Our scale represents a middle ground between high item specificity/congruence and overly broad items, which may enhance its relevance and validity for measuring motivation; it also takes a multidimensional approach to assessing writing motivation with the inclusion of items related not only to self-efficacy beliefs, but also goal orientations, attributions for success, and task interest and value.

The primary research aims of this study are to: (1) explore how sex, grade level, and writing ability impact writing motivation, activity, and performance; (2) establish the underlying factor structure of the writing motivation scale and the reliability of those factors; (3) explore how writing activity is related to writing motivation and performance; and (4) determine the best explanatory model for the relationships between the exogenous variables of sex, grade, and writing ability, and the endogenous variables associated with writing motivation, writing activity, and the criterion variable of writing performance.

Method

Participants

Data from 618 students (320 girls, 298 boys) in grades 4 through 10 (excluding grade 8) were retained for the study, which represented 82.6 % of the original

sample of 748 students from whom we collected data. Excluded were participants who did not complete all tasks, who represented a different population (English honors and AP classes, the only 8th and 12th graders in the sample), and who did not yield an adequately large sample for a grade (there were only eleven 11th graders). The 618 students came from 20 classrooms in 9 Midwest schools and 10 classrooms in 6 schools in the Pacific Northwest. Details regarding the characteristics of the sample are provided in Table 1. Elementary students (grades 4 and 5) represented 36 % of the sample, middle school students (grades 6 and 7) 29 %, and high school students (grades 9 and 10) 35 %. Of the participants, 59 % were European American, 14 % were Latin American, 9 % were African American, 5 % were Native American, 1 % were Asian American, and the rest categorized themselves as ''other''. Half of the students were considered good writers by their teachers (ranked at or above the 70th percentile in their class), whereas 16 % were classified as poor writers (ranked at or below the 30th percentile in their class).

Measures

The *Writing Activity and Motivation Scales* (*WAMS*) instrument[1] was group-administered during one class period no earlier than the third month of school so that teachers were familiar with their students' writing performance. It was read aloud to students if requested or if the teacher believed it was necessary; otherwise, students completed it at their own pace. Within 1 week of administration of the *WAMS*, students were asked to write for a half hour in response to one of two fictional story prompts posted by their teachers to assess their writing quality.

Writing motivation

The *WAMS* consisted of a total of 30 items related to writing motivation: 7 self-efficacy, 4 success attribution, 5 task interest/value, 4 mastery goal, 4 performance goal, and 6 avoidance goal items. An 11-point scale was used for each item, ranging from 0 (totally disagree) to 100 (totally agree). Many of the items on the scale were adapted from those included in scales developed by Pajares, Hartley and Valiante (2001), Eccles et al. (1989), and Shell et al. (1995). Five of the self-efficacy items related to efficacy expectations for writing skills and strategies; the remaining two items related to perceived competence for writing tasks. Two of the success attribution items specified internal attributions (ability and effort) whereas two items specified external attributions (luck and task ease). The task interest/value items specified preferential personal interest rather than transient situational interest; one item reflected attainment value instead of interest. Items on the scale that were stated negatively were reverse scored.

Table 1 Characteristics of study sample

Grade	n (% of total)	Number classes	Number schools	School attributes	% Male	% White	% Good writers	% Poor writers
4	104 (16.5)	6	3	Rural-3 Suburban-0 Urban-0 Low SES-3	44.1	70.1	64.4	13.3
5	121 (19.2)	6	5	Rural-3 Suburban-2 Urban-0 Low SES-3	47.9	80.5	50.4	17.4
6	128 (20.3)	13	5	Rural-2 Suburban-2 Urban-1 Low SES-2	46.5	57.9	45.6	26.2
7	54 (8.6)	3	3	Rural-1 Suburban-0 Urban-2 Low SES-2	44.2	43.4	38.3	31.9
9	138 (21.9)	3	3	Rural-1 Suburban-1 Urban-1 Low SES-2	47.1	54.1	42.8	5.8
10	73 (11.6)	2	2	Rural-1 Suburban-1 Urban-0 Low SES-1	58.9	55.7	54.8	12.3
Total	618	30	15		47.8	61.8	49.5	16.1

Low SES was defined as 50 % or more students eligible for free or reduced-price meals

Writing activity

On the *WAMS*, students responded to 10 items where they rated how frequently they engaged in various writing activities in or out of school during the prior month, including writing stories, poems, letters, essays, reports, and creative compositions (e.g., plays, songs), journaling, sharing writing, giving feedback, and using the writing process. A 5-point scale was used for each item, ranging from 1 (almost never) to 5 (almost daily).

Teacher judgment of writing ability

Teachers ranked each of their students for overall writing performance compared with class peers on a 9-point decile scale ranging from B10th percentile to C90th

percentile. The assigned percentile rank was used as a continuous measure of writing ability and as a categorical variable for grouping good (70th percentile or higher), average (between the 40th and 60th percentiles, inclusive), and poor (30th percentile or lower) writers, depending on the analysis. Teacher judgment of writing competence is a fairly reliable assessment technique (Hoge & Coladarci, 1989).

Narrative writing quality

Students were provided with two title prompts ("One Day of Invisibility" and "The Day I Switched Bodies with My Friend'') from which to choose to respond. Although the fictional story is not a particularly frequently used genre in middle childhood and adolescence, it was selected for this study for four reasons: (1) it is the most widely researched genre in the writing literature; (2) it is a curriculum focus for written expression at all grade levels in the states where the data were collected; (3) most norm-referenced tests of writing achievement use narrative writing, including fictional narrative (Calfee & Wilson, 2004); and (4) narrative prose may de-emphasize the relevance of content knowledge for writing quality. All of the handwritten papers were scored using an analytic trait scoring rubric ranging from 1 (poor) to 6 (outstanding) for each of five traits: conventions, sentence fluency, word choice, organization, and ideas. A set of scored anchor papers for each grade served as benchmarks for the scorers as they rated papers in grade level sets. Each paper was initially read without scoring to obtain an overall impression of writing quality and to segregate the papers into high-, medium-, and low-quality subsets. Then, all papers were scored on each trait in succession, beginning with conventions and ending with ideas, until scores for all five traits were assigned. Handwriting was ignored when scoring the conventions trait and punctuation errors were ignored when scoring the sentence fluency trait. Ultimately, the trait scores were averaged to produce a total quality score because they loaded on a single latent variable.

Following scoring training on an independent set of narrative samples, approximately 20 % of the papers were double-scored by the third and fourth authors; for the remaining papers, half were scored by the third author and half were scored by the fourth author. They attained an inter-rater reliability coefficient of 0.75 for total quality. The first and last authors served as independent raters to further ensure scoring reliability; they each scored a separate set of approximately 10 % of papers not previously double-scored by the other authors (thus, about 40 % of the stories were checked for scoring reliability). The inter-rater reliability estimates were 0.79 for the first and third authors, 0.88 for the first and fourth authors, 0.98 for the third and last authors, and 0.76 for the fourth and last authors. Moreover, the two independent raters demonstrated high inter-rater reliability ($r = 0.94$) for total quality on a small set (5 %) of the stories. A significant difference in narrative quality was evident when comparing the quality of responses to the two prompts, $t(436.72) = 3.42$, $p = 0.001$ ($M = 3.13$ for ''One Day of Invisibility" vs. $M = 2.92$ for "The Day I Switched Bodies with My Friend"). There was a significant correlation between teacher judgment of writing ability and

narrative quality, $r = 0.41$, $p \backslash .01$; a high correlation would *not* be expected because teachers were asked to judge their students' writing performance across all relevant tasks and skills.

Results

Group differences

In this study, we used three exogenous grouping variables: grade level (elementary, middle school, and high school), sex, and teacher judgment of writing ability (good, average, and poor writers). Means and standard deviations of raw scores for each dependent measure within and across groups are reported in Table 2. The dependent measures included narrative writing quality, self-reported writing activity, and varied aspects of writing motivation—goal orientations (mastery, performance, and avoidance), task interest and valuation, internal attributions for success, and self-efficacy beliefs. To explore if group differences were evident for each dependent measure, we conducted one-way ANOVAs for narrative writing quality (using prompt as a covariate) and writing activity with corresponding post hoc tests. A 3 9 2 9 3 MANOVA (to control for family-wise Type I error rate) with follow-up univariate ANOVAs and corresponding post hoc tests was conducted for the writing motivation variables. The results of the univariate tests are presented in Table 2 and we summarize the significant findings here.

Narrative quality

With respect to narrative writing quality, with the effect of prompt held constant, elementary-aged students' papers displayed lower quality than middle school students' ($d = $ -0.42) or high school students' ($d = $ -0.62) papers, which were not substantially different in total quality. Stories written by girls were judged to be of higher quality than those written by boys ($d = 0.32$). Good writers wrote higher quality papers than average ($d = 0.54$) or poor writers ($d = 0.87$), and average writers wrote better papers than poor writers ($d = 0.42$).

Writing activity

Elementary and middle school students reported writing more frequently than their counterparts in high school (ds $= 0.44$ and 0.23, respectively), whereas elementary and middle school students reported similarly frequent amounts of writing activity. Girls reported writing for a variety of purposes more frequently than boys ($d = 0.49$). Though students judged by their teachers to be poor or average writers did not significantly differ in their self-reported writing activity, these groups did report writing less frequently than students judged to be good writers (ds $= $ -0.34 and -0.06, respectively).

Measure	M	(SD)	df	F	p	Post hoc
Narrative quality	3.07	(0.75)				
Elementary students	2.83[a]	(0.75)				
Middle school students	3.16[a]	(0.83)				
High school students	3.25[a]	(0.60)	2, 614	20.24	\.001	E \ (M = H)
Males	2.94[a]	(0.76)				
Females	3.18[a]	(0.74)	1, 615	14.20	\.001	
Good writers	3.35[a]	(0.76)				
Average writers	2.99[a]	(0.58)				
Poor writers	2.73[a]	(0.66)	2, 568	34.66	\.001	G 〔 A 〔 P
Writing activity	2.29	(0.61)				
Elementary students	2.43	(0.65)				
Middle school students	2.29	(0.57)				
High school students	2.16	(0.56)	2, 597	10.78	\.001	(E = M) 〔 H
Males	2.14	(0.57)				
Females	2.43	(0.61)	1, 598	34.93	\.001	
Good writers	2.39	(0.59)				
Average writers	2.22	(0.61)				
Poor writers	2.18	(0.66)	2, 553	6.37	\.01	G 〔 (A = P)
Motivation: mastery goals	66.24	(18.69)				
Elementary students	68.93	(17.94)				
Middle school students	62.84	(18.71)				
High school students	66.42	(19.04)	2, 524	2.77	NS	
Males	64.80	(18.93)				
Females	67.59	(18.39)	1, 524	5.14	\.05	
Good writers	70.18	(18.10)				
Average writers	65.04	(18.13)				
Poor writers	58.52	(18.09)	2, 524	3.63	\.05	G 〔 A 〔 P
Motivation: performance goals	67.80	(21.51)				
Elementary students	70.89	(20.03)				
Middle school students	69.66	(23.15)				
High school students	63.12	(20.79)	2, 524	2.89	NS	
Males	66.81	(22.22)				
Females	68.75	(20.80)	1, 524	1.25	NS	
Good writers	69.82	(20.39)				
Average writers	66.58	(21.19)				
Poor writers	63.06	(23.89)	2, 524	1.46	NS	
Motivation: avoidance goals	61.35	(20.20)				
Elementary students	59.11	(21.68)				
Middle school students	65.58	(19.90)				
High school students	60.01	(18.37)	2, 524	1.26	NS	
Males	65.15	(19.30)				

Table 2 continued

Measure	M	(SD)	df	F	p	Post hoc
Females	57.72	(20.39)	1, 524	7.29	\.01	
Good writers	57.22	(20.09)				
Average writers	63.02	(20.74)				
Poor writers	67.06	(17.25)	2, 524	4.59	\.05	G \ (A = P)
Motivation: task interest/value	68.18	(22.25)				
Elementary students	72.42	(22.25)				
Middle school students	67.04	(21.52)				
High school students	64.90	(22.31)	2, 524	3.24	NS	
Males	62.40	(23.24)				
Females	73.68	(19.79)	1, 524	32.05	\.001	
Good writers	72.17	(20.50)				
Average writers	67.09	(21.74)				
Poor writers	58.49	(25.36)	2, 524	3.25	\.05	G 〔A 〔P
Motivation: internal attributions	72.67	(18.66)				
Elementary students	74.95	(18.67)				
Middle school students	71.75	(19.23)				
High school students	71.15	(18.02)	2, 524	0.92	NS	
Males	69.65	(19.81)				
Females	75.55	(17.03)	1, 524	8.96	\.01	
Good writers	78.00	(16.25)				
Average writers	70.59	(17.65)				
Poor writers	62.92	(21.14)	2, 524	11.77	\.001	G 〔A 〔P
Motivation: self-efficacy	56.72	(17.83)				
Elementary students	56.35	(18.20)				
Middle school students	56.85	(19.06)				
High school students	56.98	(16.39)	2, 524	0.48	NS	
Males	55.24	(18.89)				
Females	58.14	(16.66)	1, 524	1.73	NS	
Good writers	61.99	(17.15)				
Average writers	55.13	(16.71)				
Poor writers	47.60	(17.04)	2, 524	15.38	\.001	G 〔A 〔P

[a] Reported means are adjusted for writing prompt

Writing motivation

No significant multivariate main effect attributable to grade level was observed, $F(12, 1{,}040) = 1.75$, $p = .05$. Significant multivariate main effects were found due to sex, $F(6, 519) = 6.84$, $p \setminus .001$, and teacher judgment of writing ability, $F(12, 1{,}040) = 3.33$, $p \setminus .001$. A significant interaction between sex and teacher judgment of writing ability was observed, $F(12, 1{,}040) = 1.88$, $p \setminus .05$; all other interactions were non-significant. The interaction between sex and teacher judgment

of writing ability was associated with responses to the mastery goal items, $F(2, 524) = 4.96$, $p \backslash .05$, task interest/value items, $F(2, 524) = 6.77$, $p \backslash .01$, and internal attributions for success items, $F(2, 524) = 3.94$, $p \backslash .05$. Specifically, only girls who were judged to be poor writers adopted writing mastery goals to a greater extent than boys ($Ms = 65.26$ vs. 55.21). Only girls who were judged to be poor or average writers reported higher levels of writing task interest/value than boys ($Ms = 75.38$ vs. 50.33 and 71.21 vs. 63.48, respectively). Likewise, only girls who were judged to be poor writers displayed stronger internal attributions for success in writing than boys ($Ms = 74.14$ vs. 57.58). Univariate tests for main effects showed girls reported adopting mastery goals to a greater extent than boys ($d = 0.15$) and, conversely, reported adopting avoidance goals less often ($d = -0.37$); boys and girls did not differ with respect to the degree to which they adopted performance goals. Girls reported stronger writing task interest and valuation than boys ($d = 0.52$) and a higher degree of internal attribution for success ($d = 0.32$), but did not differ from boys in their self-efficacy beliefs.

In comparison to average and poor writers, good writers adopted mastery goals to a greater extent ($ds = 0.28$ and 0.64, respectively), reported greater interest in and valuation of writing tasks ($ds = 0.24$ and 0.60, respectively), displayed a higher degree of internal attribution for success ($ds = 0.44$ and 0.81, respectively), and exhibited stronger self-efficacy beliefs ($ds = 0.41$ and 0.84, respectively). Similarly, in comparison to poor writers, average writers adopted mastery goals to a greater extent ($d = 0.36$), reported greater interest in and valuation of writing tasks ($d = 0.37$), displayed a higher degree of internal attribution for success ($d = 0.40$), and exhibited stronger self-efficacy beliefs ($d = 0.45$). Writers of different abilities reported adopting performance goals to an equivalent extent; however, good writers adopted avoidance goals less often than average ($d = -0.28$) or poor writers ($d = -0.53$), who did not differ in this respect.

Examination of assumptions

We examined the correlations between items within each dimension of motivation measured by the *WAMS* (i.e., self-efficacy, task interest/value, internal attribution, three goal orientations) prior to conducting factor analyses. All items related to mastery, performance, and avoidance goal orientations, respectively, were significantly correlated with other related items (rs between 0.11 and 0.50), except for one avoidance goal item (I would rather read than write) that did not correlate with another item (If I don't have to revise my work, I am happy); this item also produced generally low magnitude but significant correlations with other avoidance goal items. Items related to task interest and value, internal attribution, and self-efficacy, respectively, were all significantly correlated with other related items (rs between 0.10 and 0.69). We also examined the correlations between the arithmetic mean of items within a dimension with all other dimensions of motivation. All dimensions were significantly correlated with each other in the predicted direction (i.e., avoidance goals were inversely related to other aspects of writing motivation; rs between -0.14 and 0.68). Thus, these different aspects of motivation were non-orthogonal in this sample (and this was confirmed in our SEM reported below).

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Multiple methods were used to analyse the reliability and structure of the *WAMS* and the narrative writing quality scales. These included an examination of the internal consistency reliabilities of the items hypothesized to form a particular scale, an analysis of response patterns to identify anomalous patterns (i.e., identification of potential outliers), and a confirmatory factor analysis (CFA) to identify latent variables within the data. Examination of the individual items raised a few noteworthy concerns. First, though some items were nearly normally distributed, there were quite a few that were clearly skewed. Second, many of the items on the motivation portion of the *WAMS* demonstrated multiple response-point inflations in their distributions; as might be expected, a large number of respondents marked the first (0), middle (50), or last (100) anchor of the 11-point scale. Finally, it was observed that a number of items demonstrated inconsistent response patterns.

To address the lack of normality in item responses, factor analyses were conducted with robust estimation techniques. Results were comparable to those obtained using maximum likelihood estimation (MLE); thus, the lack of normality for many of the items appeared to be a negligible issue and all reported results were obtained using MLE. To address the multiple response-point inflations, we collapsed the scale from an 11-point scale to a scale with 5 points (with the midpoint of 3 covering the original scale points of 40, 50, and 60). Again, comparable results were obtained for the CFAs either way. Consequentially, all results reported below were obtained from the data analysed in its original format. Finally, potential outliers were located using an iterative cluster regression analysis (Niu & Harbaugh, 2010). To determine if the presence of identified outliers influenced the analyses, results were run with and without the flagged data. Once again, comparable results were obtained in each analysis, so the results reported below include all respondents for whom there were no missing data ($n = 530$), because complete data records are considered necessary when using SEM (Kline, 1998).

The CFAs and structural equation modeling (SEM) in this study were run using EQS v6.0 and R v2.13.0 and model fit was evaluated with the following indices: the Chi-square goodness-of-fit (v^2), the comparative fit index (CFI), the normed fit index (NFI), and the root mean square error of approximation (RMSEA). Values of CFI and NFI above 0.90 (Bentler, 1990) and RMSEA below 0.08 (Browne & Cudeck, 1993) are indicative of good fit. All CFAs were imposed on a random sample of half the data and then compared with results for the second half of the sample to test the integrity of factors; reported results are CFAs for the full sample.

Instrument analysis: writing quality scale

An initial examination of the internal reliability for the five traits of narrative quality suggested a single latent variable. An exploratory factor analysis produced a scree plot and eigenvalues strongly suggestive of the presence of a single latent variable (60 % of the variance was accounted for by a single factor). Summary statistics for the trait scores are provided in Table 3. The CFA for the measurement model confirmed that a single-factor model was appropriate for these data. Additionally, the modification indices (Lagrange Multiplier, or LM test) suggested an error

Scale/item	M (SD)	Cronbach a If item deleted	Factor loading
Narrative writing scale			
Ideas	3.2 (0.9)	0.84	0.69
Organization	3.1 (0.9)	0.84	0.68
Sentence fluency	3.3 (0.9)	0.83	0.84
Word choice	3.2 (0.9)	0.83	0.84
Conventions	2.9 (0.9)	0.87	0.65
Aggregate	3.1 (0.7)	$a = 0.87$	
Writing activity scale			
F1 (story)	2.0 (0.9)	0.71	0.39
F2 (letter)	2.4 (1.3)	0.71	0.42
F3 (report)	2.4 (1.0)	0.71	0.43
F4 (poem)	1.7 (1.0)	0.71	0.38
F6 (persuasive)	2.0 (1.0)	0.70	0.48
F7 (play/script/song)	1.7 (1.1)	0.70	0.41
F8 (shared writing)	2.7 (1.2)	0.68	0.62
F9 (helped another)	2.3 (1.1)	0.69	0.57
F10 (planning)	2.7 (1.1)	0.69	0.56
Aggregate	2.2 (0.6)	$a = 0.72$	
Motivational beliefs scale			
SE2	68.4 (25.0)	0.86	0.74
SE7	65.9 (27.6)	0.87	0.62
SE16	47.8 (27.9)	0.87	0.59
SE21	68.2 (25.2)	0.86	0.69
TV5	61.5 (29.4)	0.87	0.58
TV8	68.2 (30.5)	0.86	0.69
TV12	70.5 (26.3)	0.86	0.64
TV18	79.3 (24.3)	0.88	0.44
TV22	60.4 (33.6)	0.86	0.71
AT17	58.2 (28.7)	0.86	0.78
AT20	84.2 (20.5)	0.88	0.30
AT30	75.4 (30.4)	0.88	0.47
Aggregate	67.3 (18.1)	$a = 0.88$	
Achievement goal orientation scale			
MG14	69.4 (29.3)	0.39	0.47
MG25	85.1 (19.7)	0.44	0.53
MG28	59.4 (31.3)	0.41	0.52
PG4	54.3 (32.1)	0.62	0.56
PG13	70.9 (31.5)	0.65	0.54
PG15	77.4 (27.3)	0.61	0.59
PG26	66.8 (29.3)	0.57	0.67
AG6	36.2 (32.4)	0.58	0.69
AG10	57.8 (35.6)	0.55	0.67

Table 3 Summary statistics for scale items

Table 3 continued

Scale/item	M (SD)	Cronbach a If item deleted	Factor loading
AG23	63.7 (32.7)	0.68	0.36
AG29	66.4 (33.1)	0.59	0.59
Aggregate			
MG	71.3 (19.2)	$a = 0.51$	
PG	67.3 (21.4)	$a = 0.68$	
AG	56.0 (23.7)	$a = 0.67$	

correlation between two of the traits: ideas and organization. While it might be argued that including the error term merely inflates the fit indices, comparable results were obtained with or without the inclusion of the error correlation. Additionally, there is nothing to suggest that the unaccounted variance among these two traits was unrelated. Thus, the inclusion of the error correlation was deemed acceptable. The CFA on the measurement model with the 5 traits produced marginal fit indices: $v^2(4) = 36.6$, $p \setminus .001$; NFI = 0.975; CFI = 0.977; RMSEA = 0.124. Standardized factor loadings are reported in Table 3. We obtained a Cronbach's a of 0.87 for the writing quality factor.

Instrument analysis: writing activity scale

A preliminary cluster analysis of the 10 writing activity items was conducted. Nearly all of the various clustering methods suggested there might be one or two clusters of items. The relatively high internal consistency reliability of the whole scale suggested the presence of a single latent variable, thus, further analysis via CFA was warranted. Summary statistics for item responses are provided in Table 3. The CFA for the measurement model confirmed that a one-factor model was appropriate for the data (with the item regarding journaling dropped due to sex-related and bimodal response patterns). The CFA for the measurement model with the 9 retained writing activity items produced marginal fit indices: $v^2(27) = 104.3$, $p \setminus .001$; NFI = 0.845; CFI = 0.879; RMSEA = 0.074. Standardized factor loadings are reported in Table 3. We obtained a Cronbach's a of 0.72 for the writing activity factor.

Instrument analysis: motivational beliefs (self-efficacy, task interest/value, attribution)

The items on this portion of the WAMS were chosen to measure motivational beliefs reflecting self-efficacy, attributions, and task interest and value. While our original intent was to examine a measurement model with these three separate constructs, preliminary exploration of the data demonstrated strong internal consistency reliability when all items were grouped together and a dramatic decline in the reliability estimates when items were segregated. This suggested that (1) there was a

second-order latent variable or (2) the items reflected a single dimension related to an aggregate of motivational beliefs. Summary statistics for item responses are provided in Table 3.

After an initial examination of CFA for the measurement model, it was decided to remove four items from the scale: three self-efficacy for writing skills items and one external attribution item. The primary issue for these items was weak factor loadings. One attribution item was flagged as loading weakly with a standardized coefficient just less than 0.30, but examination of the scale with and without this item indicated no difference in findings and thus it was retained. The LM test suggested a series of error correlations, which coincided with the original theoretical model specifically for task interest/value, should be added. The CFA for the measurement model with the remaining 12 items produced strong fit indices: $v^2(51) = 190.5, p \setminus .001$; NFI $= 0.923$; CFI $= 0.942$; RMSEA $= 0.072$. Standardized factor loadings are reported in Table 3. The internal consistency reliability for the aggregate scale was strong ($a = 0.88$).

Instrument analysis: achievement goal orientations

Summary statistics for responses on mastery, performance, and avoidance goal items are provided in Table 3. After an initial examination of the CFA for the measurement model, it was decided to remove three items from the scale: two avoidance goal items and one mastery goal item. The primary concern was weak factor loadings coupled with LM tests that revealed improved fit indices with the addition of cross-loadings. The CFA on the measurement model with the remaining 11 items produced reasonable fit indices: $v^2(41) = 119.4, p \setminus .001$; NFI $= 0.887$; CFI $= 0.922$; RMSEA $= 0.060$. Standardized factor loadings are reported in Table 3. Internal consistency reliability estimates for the aggregate scales were weak to moderate (mastery, $a = 0.51$; performance, $a = 0.68$; and avoidance, $a = 0.67$). Curiously, reliability of the mastery goal scale changed across grades; adequate reliability was obtained for grades 7 and above. This suggests that students at the lower grades may have interpreted these items differently and caution should be applied when interpreting the findings associated with the mastery goal dimension. The correlations between the latent variables were as follows: $r = 0.75$ for mastery and performance, $r = -0.71$ for mastery and avoidance, and $r = -0.34$ for performance and avoidance.

Structural equation modeling (SEM)

As this study examined the potential relationships between writing activity, motivational beliefs and goal orientations, and writing quality, an exploratory approach was used to examine possible models relating the latent variables. Two general models were examined. As prior research suggests that motivational beliefs are precursors to achievement goal orientations, each model was built with motivational beliefs (self-efficacy, attributions, task interest/value) added as a predictor for the three possible achievement goal orientations. Writing quality was the final variable in the model. The two models included writing activity, but this

variable was added before the motivational beliefs in the first model and after them in the second model; that is, the first model examined writing activity as a possible moderator of motivational beliefs whereas the second model examined writing activity as a potential mediator of the relationships between motivational beliefs and narrative quality. As the data were correlational and collected at a single point in time, caution in interpreting any causal relations is warranted.

The next stage of the analysis was to introduce the four exogenous manifest variables of sex, grade, teacher judgment of writing ability, and prompt. The strategy employed was to first identify a model with the latent variables only; once a model with reasonable fit was obtained, the teacher judgment, grade, and sex variables (in that order) were added to examine how the model changed. Finally, once a reasonable model was obtained with the first three exogenous manifest variables, writing prompt was added as a predictor of quality (recall that prompt resulted in significant differences in writing quality). It was hoped that the addition of the exogenous manifest variables would produce comparable findings to the model without these variables. In each case, this was confirmed. Such a finding suggests that the relationships between the latent constructs were genuine and not attributable to confounding with the exogenous variables.

For a baseline comparison, the combined measurement model was used with the following fit indices: $v^2(623) = 2,165.5, p \setminus .001$; NFI $= 0.701$; CFI $= 0.765$; RMSEA $= 0.068$. As hoped, the fit indices were relatively poor for the baseline model—one wishes to establish stronger fit between the model and the data with the inclusion of relationships among the variables (relationships that are taken to be zero in the measurement model). The next stage was to rerun the analyses with the correlation matrix including each exogenous manifest variable of interest. The objective was to add paths between all latent variables and the given manifest variable entered and retain all the significant paths. Results for the final model are presented in Table 4 (note that sex and prompt were correlated, and thus necessitated the addition of a correlated error term between these manifest variables). With this model confirmed as a reasonable explanation of the relationships between the proposed latent variables, it was rerun using the scores from the aggregate scales to permit comparison of our results to those obtained in future studies with the *WAMS*. The descriptive statistics for the final aggregate scales and correlations between variables examined are presented in Table 5. The fit of the overall model was excellent: $v^2(26) = 67.8, p \setminus .001$; NFI $= 0.944$; CFI $= 0.964$; RMSEA $= 0.055$. This final model with standardized path coefficients is presented in Fig. 1.

An alternate model was examined in which we placed writing activity between the latent variables associated with achievement goal orientations and the outcome variable of writing quality, thus assessing the potential for writing activity to mediate the relationship between motivation and narrative writing quality. The obtained results indicated no relationship between writing activity and narrative quality, with minimal influence of motivational beliefs and achievement goal orientations on writing activity. As these two models were not nested, direct model-to-model comparisons were not possible. However, the parsimony of the first model and the better goodness-of-fit statistics obtained with it suggest that the first model was a better explanation of the relationships among the variables.

Table 4 Fit statistics and standardized path coefficients for addition of paths from exogenous manifest variables to the baseline model

	Model 0	Model 1	Model 2	Model 3	Model 4
v^2	2,033	1,928.3	1,860.3	1,826	1,764.1
df	769	767	765	762	760
CFI	0.821	0.836	0.845	0.850	0.858
RMSEA	0.056	0.053	0.052	0.051	0.050
Dv^2		104.7	68	34.3	61.9
Ddf		2	2	3	2
p value		\.001	\.001	\.001	\.001
Performance goals → quality	-0.39***	-0.30**	-0.26**	-0.26**	-0.27*
MB → mastery goals	0.85***	0.85***	0.85***	0.87***	0.87***
MB → performance goals	0.63***	0.62***	0.62***	0.64***	0.64***
MB → avoidance goals	-0.64***	-0.66***	-0.65***	-0.65***	-0.65***
MB → quality	0.44***	0.26**	0.28**	0.28**	0.29**
Activity → performance goals	0.18**	0.20**	0.19**	0.20**	0.20**
Activity → avoidance goals	-0.19***	-0.18**	-0.18***	-0.19*	-0.19**
Activity → MB	0.61***	0.59***	0.58***	0.59***	0.59***
Rank → quality		0.37***	0.35***	0.35***	0.34***
Rank → MB		0.26***	0.26***	0.26***	0.26***
Grade → quality			0.23***	0.24***	0.22***
Grade → activity			-0.30***	-0.29***	-0.29***
Sex → mastery goals				0.13**	0.13**
Sex → performance goals				0.12**	0.13**
Sex → activity				-0.24***	-0.24***
Prompt → quality					-0.15***

Standardized path coefficients marked with * are significant at $p \backslash$ .06, with ** are significant at $p \backslash$ .02, and with *** are significant at $p \backslash$ .001. MB = Motivational Beliefs (self-efficacy, task interest/value, attributions). Models included (a) two correlations between latent variables (performance & avoidance goals and performance & mastery goals) and (b) four error correlations. Final model includes a correlation between sex and prompt

Discussion

This study offers several major contributions to the extant literature on writing motivation. First, we used a large convenience sample of children and youth in grades 4 through 10 to examine how relationships between writing motivation and writing performance differ between (a) elementary, middle, and high school students, (b) males and females, and (c) poor, average, and good writers. Second, we incorporated frequency of writing activity into our predictive modeling, which has not before been explored in this achievement domain. Third, we developed a writing motivation scale that balanced the need for item specificity and congruence with the need for a broadly relevant and valid instrument for the domain, that accommodated the need for an adequately sensitive measure of motivation, and that addresses the

Table 5 Summary statistics and correlation matrix for aggregate scale items used in final SEM

Variable	M (SD)	Range	MB	MG	PG	AG	Activity	Quality	Grade	Rank	Sex
Motivation beliefs (MB)	67.3 (18.1)	[4.2, 99.2]									
Mastery goals (MG)	71.3 (19.2)	[0.0, 100.0]	.58								
Performance goals (PG)	67.3 (21.4)	[0.0, 100.0]	.59	.43							
Avoidance goals (AG)	56.0 (23.7)	[0.0, 100.0]	2.56	2.41	2.20						
Writing activity	2.2 (0.6)	[1.0, 4.3]	.49	.29	.37	2.37					
Writing quality	3.1 (0.7)	[1.0, 5.6]	.14	.09	2.07	2.10	-.01				
Grade	6.9 (2.2)	[4.0, 10.0]	2.13	2.10	2.17	.13	2.24	.23			
Rank	59.7 (22.3)	[10.0, 90.0]	.29	.17	.10	2.23	.11	.37	.02		
Sex			2.22	-.04	-.05	.17	2.22	2.10	.05	2.20	
Prompt			.04	.00	.04	-.03	.12	2.16	2.09	-.03	2.30

Correlations listed below the dividing line are point-biserial correlations; the correlation listed to the right of the dividing line is a phi coefficient; all other correlations are Pearson correlation coefficients. Correlations that failed to reach significance at the .05 level are not bolded; all other correlations are significant at $p \setminus .01$
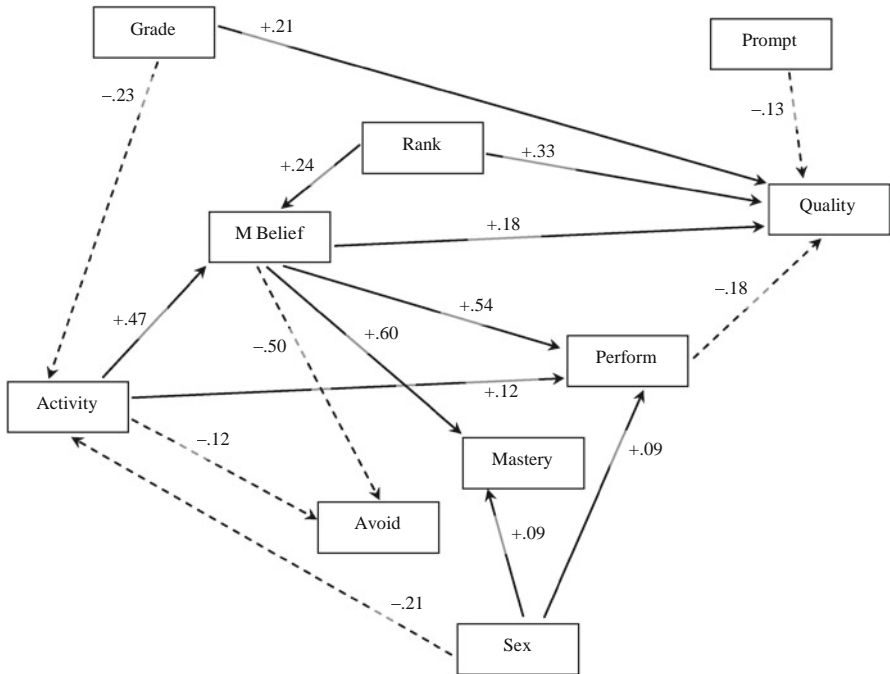
Fig. 1 Final path model for aggregate scales with standardized path coefficients. *Note* All paths significant at $p \setminus .005$ except for sex to mastery goals and sex to performance goals ($p \setminus .01$); negative paths indicated with *dashed lines*

multidimensional nature of writing motivation through the incorporation of expectancy-value and achievement goal theories. The major findings of our study are discussed below.

Effects of grade, sex, and teacher judgment of writing ability

We found a moderate effect of grade on the quality of students' stories; narrative quality improved between 4th and 10th grades by almost a half point on our 6-point scale. This finding was consistent with other research that has demonstrated that writing performance improves over time (Byrnes & Wasik, 2009). Such improvements likely accrue because students gradually gain greater topic, genre, and linguistic knowledge, slowly develop mastery of writing conventions, and with experience and instruction more frequently engage in effective writing processes. As expected, poor writers wrote qualitatively inferior stories compared to stories written by good writers; there was nearly a full standard deviation difference (a half point on the quality scale) between these students' average scores. Another unsurprising finding was the small but significant effect of sex on writing quality— female students wrote stories that were a quarter of a point higher in quality. Additionally, teachers reported girls' writing ability to be higher than boys'. These findings mirror the sex differences in writing performance observed between 1998

and 2007 on the National Assessment of Educational Progress (NAEP). Specifically, females outperformed males by about 20 scale score points in grades 8 and 12 for narrative, persuasive, and informational writing tasks (U.S. Department of Education, 2008). Grade level and teacher judgment of writing ability (i.e., relative class rank), but not sex, had significant direct effects on story quality in the SEM analyses of our data, with writing ability having the largest impact (which is not surprising because this measure also accounts for prior motivational determinants of writing ability). For every one standard deviation increase in class ranking of writing ability, narrative quality rose a third of a standard deviation while holding all other predictors constant. Sex did have an indirect influence on narrative quality via its impact on performance goals and writing activity. A separate independent contributor to story quality was the prompt to which students responded.

Students' self-reported writing activity declined with age and girls reported writing for varied purposes more often than boys. Likewise, good writers reported writing more frequently than average or poor writers (who did not differ in their self-reported writing activity). Small direct influences of grade level and sex on writing activity were confirmed in our predictive modeling of the data, but writing ability assessed by teachers' rankings was not a significant predictor of writing activity. Overall, students in our sample reported relatively low levels of writing activity, averaging a little over 2 (once or twice a month) on a 5-point scale. This may reflect the fact that some forms of writing that mostly occur out of the classroom (e.g., electronic postings and status updates) and some typical in-class writing assignments in these grades (e.g., summaries) were not included in our scale. Nevertheless, the findings are largely expected. A recent survey conducted by the Pew Internet & American Life Project (Lenhart, Madden, Macgill, & Smith, 2007) found that girls dominated online content generation through blogging and web page authoring activities. Girls may write more often simply because writing is gender stereotyped as a feminine activity (Pajares & Valiante, 2001). Applebee and Langer (2006) found that 12th graders reported doing slightly less writing in their content area coursework (e.g., writing science reports and opinion papers in social studies) than 8th graders.

According to the SEM analyses of our data, writing ability based on teacher rankings made a moderate direct contribution to predicting motivational beliefs (self-efficacy, task interest/value, and attributions), though it did not directly impact goal orientations. For every standard deviation increase in writing ability, motivational beliefs increased by a quarter of a standard deviation while holding all other predictors constant. Sex did not play a significant role in directly explaining variance in motivational beliefs (it did indirectly via its small impact on writing activity), but sex did have a direct influence on mastery and performance goal orientations. In contrast to results obtained by Pajares and Valiante (1999), Knudson (1991, 1992), and Anderman and Midgley (1997), grade level did not have a direct influence on motivational beliefs or achievement goal orientations in our sample, though grade indirectly influenced motivational beliefs through its impact on writing activity, a variable not included in the work of these scholars. This may be due, in part, to having some self-efficacy for writing *skills and strategies* items on the self-efficacy portion of the *WAMS*. Pajares (1996a, b) argued that skill-related self-efficacy beliefs are not interchangeable with task-related self-efficacy beliefs

and Troia, Shankland, and Wolbers (2012) theorized that writing skill self-efficacy beliefs are slow to change in grade school because the acquisition of increasingly sophisticated writing skills and strategies necessitates a protracted developmental period. Additional empirical work is needed to explore this hypothesis, but we agree that self-efficacy beliefs for both writing skills and tasks need to be measured separately when the effects of other variables are considered.

Effects of motivation beliefs, goals, and writing activity

Mastery, performance approach, and task avoidance goals were each predicted by motivational beliefs in the SEM analyses of our data. Adaptive writing goals such as mastery and performance approach goals were best explained by how much students perceived writing tasks to be important and personally relevant, by the degree to which they attributed writing success to internal rather than external forces, and by how competent they perceived themselves to be at writing tasks. Conversely, task avoidance was negatively related to these positive motivational beliefs. Other researchers have reported a positive relationship between adaptive goals and self-efficacy beliefs (e.g., Pajares et al., 2000; Pintrich & Schunk, 2002). Because our modeling of the data led to a combination of the components of motivational beliefs as a second-order latent variable, it is impossible for us to assess the separate impact of each component on achievement goal orientations, but our findings are in line with prior findings and theoretical assumptions and indicate that motivational beliefs have a large effect on achievement goal orientations.

Writing activity directly influenced students' motivational beliefs and goal orientations. Specifically, students who reported writing more often for a variety of purposes exhibited stronger motivational beliefs and greater endorsement of performance approach goals, while endorsing task avoidance goals less. Writing activity did not contribute to a mastery goal orientation, either directly or indirectly. Wigfield and Guthrie (1997) and Baker and Wigfield (1999) reported significant correlations between self-efficacy for reading, performance approach goals in reading, and reading activity; thus, our findings in the domain of writing are consistent with those reported in the domain of reading and suggest that writing activity exerts a significant influence on multiple components of motivation. This finding (in conjunction with the observed decline in self-reported writing activity by the time students reach high school) has implications for instructional practice, in that teachers should encourage students to write frequently for a variety of purposes, both in and out of school, to enhance students' motivation to write, which in turn would be predicted to lead to improvements in the quality of their writing. A recent meta-analysis of writing instructional practices by Graham, Kiuhara, McKeown and Harris (in press) yielded an effect size of 0.30 for studies that examined the effects of increased amounts of student writing on writing quality in grades 2–6. Together, these findings make a strong case for increasing the amount of time students spend writing across grades.

Motivational beliefs directly contributed to the quality of the stories written by students in our study; for every standard deviation increase in motivational beliefs, there was approximately two-tenths of a standard deviation increase in narrative

quality when controlling for other predictors in the model. A number of studies in the domain of writing have shown that self-efficacy is the greatest contributor among motivational variables to achievement outcomes (e.g., Pajares et al., 2000; Shell et al., 1989, 1995) and our findings do not necessarily counter those of prior research, but we suggest that when multiple aspects of motivational beliefs are measured simultaneously (as was done in this study), the effects of self-efficacy may be more nuanced. Our findings suggest that teachers should simultaneously attend to (a) promoting interest in writing through the use of authentic writing purposes and tasks for real world audiences that accommodate gendered views of writing, (b) reinforcing effort attributions for success when students are initially mastering a skill, strategy, or task, and (c) promoting positive self-efficacy beliefs by scaffolding students' success in writing using strategy instruction (see Gersten & Baker, 2001).

Performance approach goals also made a direct contribution to narrative writing quality (and of the same magnitude as motivational beliefs), but the relationship was in the negative direction. Although we assumed performance approach goals would serve an adaptive function for task performance, our findings counter this assumption. The nature of performance goals is strongly debated in the literature and there have been conflicting results reported. Obviously, further investigation is required.

Limitations

Five limitations to this study should be noted. First, the reliability estimates for some of the measures were not strong. In particular, the internal consistency reliability estimate for the mastery goal orientation portion of the *WAMS* fell below 0.60, which is minimally acceptable for preliminary research (e.g., scale development) according to Nunnally (1978). Given that other scholars have developed scales measuring goal orientations with more acceptable reliability (e.g., Bong, 2004; Roeser, Midgley, & Urdan, 1996), it is likely the *WAMS* requires further refinement.

Second, because our data were multi-level in nature (students nested within classrooms nested within schools nested within states), one might argue that the single-level analyses employed here were not methodologically appropriate because they potentially underestimate error terms. However, we believe this is not a substantive issue with our data because the majority of our findings were highly significant. More importantly, we believe this limitation is offset by the affordance of more generalizeable findings provided by the large sample distributed across classes, grades, schools, and states. Of course, the fact that the respondents were not randomly sampled from the population does place constraints on generalizability.

Third, although we attempted to increase the measurement precision of the *WAMS* over typical Likert scales, we were not entirely successful in doing this—a number of students responded to at least some items as if there were only three scale points (0, 50, and 100 % agreement). Thus, we feel that the response format used by Pajares et al. (2001), where students generate a percent agreement on a full continuum, is likely a better approach when feasible and developmentally appropriate.

Fourth, we did not employ a standardized norm-referenced assessment of writing ability in this study. Consequently, we are unable to make normative comparisons and precisely gauge the writing achievement of the students in our sample. This does have implications for making generalizations about the relationships between writing motivation, activity, and quality. The teachers judged nearly 50 % of the sample to be good writers and only 16 % to be poor writers, possibly indicating the sample would not be comparable to a typical sample of students. More importantly, teacher judgment of writing ability, though considered an acceptable measure of writing performance, is likely not as reliable as a formal test of writing.

Finally, we used narrative writing quality as our focal criterion variable and only collected a single sample from each student. It is entirely possible that the model specified by the SEM of our data would not be replicable across other genres of writing or even other narrative samples. Narrative writing performance cannot be assumed to be a reliable indicator of performance on other kinds of writing tasks (e.g., Schoonen, 2005). Likewise, a single writing sample is not likely to be a valid representation of a student's true writing performance. However, these problems are not confined to experimental writing measures; the same criticisms can be leveled against norm-referenced assessments of text composition which typically evaluate a single genre with a single writing sample (e.g., Olinghouse & Santangelo, 2011). Nevertheless, we have no theoretical rationale for assuming motivational constructs and personal characteristics would be differentially predictive of other kinds of writing performance. Moreover, our measures were sufficiently broad to afford high predictive utility across tasks, though this assumption requires empirical validation. We urge caution in drawing conclusions regarding the generalizability of the results reported here for these reasons, but note that findings from any study in which a single measure of writing performance, norm-referenced or otherwise, is used to judge students' writing are subject to the same caution.

Conclusion

The relationships between motivational beliefs specified in expectancy-value theory, achievement goal orientations, activity, and performance in the domain of writing are complex. Overall, we found that students' motivational beliefs about writing, specifically their self-efficacy for writing skills and tasks, their writing task interest and perceived value, and their attributions for writing success, mediated the relationship between their writing activity and the quality of their stories. Performance approach goals (that is, lower levels of pursuit of such goals) also mediated the relationships between writing activity, motivational beliefs, and writing quality. However, sex, grade, and teacher ranking of writing ability also influenced some of these relationships, with grade and writing ability operating as direct predictors of text quality. Our findings suggests that both expectancy-value and achievement goal theories offer explanatory power for writing performance and that the relationships between self-efficacy beliefs, task interest and value, and performance attributions (i.e., motivational beliefs) are strong and may not operate

independently, a supposition that has been put forth by other scholars but not directly tested in the domain of writing prior to this study.

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