Relating Beliefs in Writing Skill Malleability to Writing Performance: The Mediating Role of Achievement Goals and Self-Efficacy

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Abstract: It is well established that students' beliefs in skill malleability influence their academic performance. Specifically, thinking of ability as an incremental (vs. fixed) trait is associated with better outcomes. Though this was shown across many domains, little research exists into these beliefs in the writing domain and into the mechanisms underlying their effects on writing performance. The aim of this study was twofold: to gather evidence on the validity and reliability of instruments to measure beliefs in skill malleability, achievement goals, and self-efficacy in writing; and to test a path-analytic model specifying beliefs in writing skill malleability to influence writing performance, via goals and self-efficacy. For that, 196 Portuguese students in Grades 7-8 filled in the instruments and wrote an opinion essay that was assessed for writing performance. Confirmatory factor analyses supported instruments' validity and reliability. Path analysis revealed direct effects from beliefs in writing skill malleability to mastery goals (β = .45); from mastery goals to self-efficacy for conventions, ideation, and self-regulation (β = .27, .42, and .42, respectively); and from self-efficacy for self-regulation to writing performance (β = .16); along with indirect effects from beliefs in writing skill malleability to self-efficacy for self-regulation via mastery goals (β = .19), and from mastery goals to writing performance via self-efficacy for self-regulation (β = .07). Overall, students' mastery goals and self-efficacy for self-regulation seem to be key factors underlying the link between beliefs in writing skill malleability and writing performance. These findings highlight the importance of attending to motivation-related components in the teaching of writing.

Keywords: writing, motivation, beliefs in writing skill malleability, achievement goals, self-efficacy

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1. Introduction

People organize their world on the basis of meaning systems that emerge from their implicit theories, which are fundamental assumptions about the nature of the self and the social world (Molden & Dweck, 2006). Implicit theories have been largely studied in the school context, in which students were found to endorse different beliefs about the malleability of their skills (Dweck, 1999, 2012; Dweck & Leggett, 1988): Students holding an *incremental belief* represent ability as an increasable quality that can be developed, whereas students holding an *entity belief* represent it as a fixed entity that cannot be changed. Empirical research found that these beliefs impact academic performance; specifically, incremental beliefs tend to lead to better outcomes than entity beliefs (Blackwell, Trzesniewski, & Dweck, 2007; Chen & Pajares, 2010; Good, Aronson, & Inzlicht, 2003). This link between beliefs in skill malleability and academic performance is particularly evident in challenging tasks (Dweck, 1999, 2012). Writing is clearly one of those tasks, given its complexity and heavy cognitive demands (Olive, 2014). Indeed, most current cognitive models of writing largely agree that writing involves four cognitive processes: *planning processes* that set rhetorical goals, which guide the generation and organization of ideas; *translating processes* that convert ideas into linguistic forms; *transcription processes* that draw on spelling and handwriting (or typing) to externalize language in the form of written text; and *revising processes* that monitor, evaluate, and change the intended and the actual written text (Hayes, 1996; Kellogg & Whiteford, 2009; Olive & Kellogg, 2002). These are resource-demanding processes that, during writing, need to be effectively orchestrated within the constraints of working memory (Kellogg & Whiteford, 2009; Olive & Kellogg, 2002).

Despite the challenging nature of writing, there is a lack of research examining the role of beliefs in writing skill malleability in this domain (Bruning & Horn, 2000). This study examined the link between these beliefs and writing performance, by testing the mediating role of achievement goals and self-efficacy. As will be detailed, achievement goals are likely mediators because considerable research has shown that they are influenced by the beliefs that students hold about skill malleability (Dweck, 1986, 1999; for a meta-analysis, see Burnette, O'Boyle, VanEpps, Pollack, & Finkel, 2013) and impact performance through various processes and beliefs (Blackwell et al., 2007), such as self-efficacy (Mason, Boscolo, Tornatora, & Ronconi, 2013). To test the mediating role of self-efficacy beliefs is particularly important. Self-efficacy has received little attention within this field of research (Chen & Pajares, 2010), despite playing a key role in academic motivation and performance (Pajares, 2003).

In the rest of the introduction we present a previous study investigating students' beliefs in writing skill malleability, followed by a summary of research into achievement goals' antecedents and outcomes, as well as into the association of self-efficacy with achievement goals and performance. Finally, the specific purposes and hypotheses of the current study along with its main contributions are described.

1.1 Beliefs in Writing Skill Malleability

The majority of studies investigating these beliefs relied on Dweck's original scale, which is a three-item scale measuring beliefs in writing skill malleability in general (Dweck, 1999; for validity and reliability evidence, see Dweck, Chiu, & Hong, 1995). However, as noted by Chen and Pajares (2010), adolescents may hold domain-specific beliefs. Given this, Limpo and Alves (2014) developed an instrument to measure beliefs in writing skill malleability, by adapting Dweck's general scale to the writing domain. Across two studies, they provided preliminary evidence on the validity and reliability of this scale. To test its predictive validity, we also examined whether these beliefs influenced students' response to writing instruction. Over 12 weekly 90-min lessons, 109 fifth and sixth graders received a planning intervention, which taught them a writing strategy to plan opinion essays together with self-regulation strategies, following the Self-Regulated Strategy Development model (Harris & Graham, 2009). This is a highly effective evidence-based instructional model designed to address critical ingredients of writing development, such as skills, strategies, knowledge, and motivation. At the middle and end of instruction, intervention students displayed better writing performance – assessed through the quality of their texts – compared to control students, who received standard writing instruction (n = 83). Students' beliefs in their writing skill malleability were measured before instruction. Latent growth modeling was used to examine the predictive effects of these beliefs on writing performance at pretest, and on growth in writing performance observed in intervention students. As expected, results showed that the more intervention students conceived writing as an incremental skill, the better the quality of their texts at pretest, and the more text quality improved throughout instruction.

This study provided original evidence on the link between beliefs in writing skill malleability and writing. However, we did not examine the mechanisms through which stronger beliefs in writing skill malleability were associated with better writing performance and learning throughout the intervention. The current study was aimed at clarifying this relationship, specifically by examining the likely mediators of the relationship between beliefs in writing skill malleability and writing performance measured at a single time point. Research in other domains has shown that beliefs in skills malleability impact performance by setting specific motivational frameworks at the core of which are achievement goals (Dweck, 1999; Dweck & Leggett, 1988).

1.2 Achievement Goals

Achievement goals refer to students' purposes or desired outcomes for engaging in academic activities (Pintrich, 2000a). There is general agreement on a trichotomous model of achievement goals[1], including three major types of goal: *mastery goals* which reflect an orientation towards learning, understanding, and mastering tasks for increasing competence; *performance-approach goals* which represent a concern with surpassing others for demonstrating competence; and *performance-avoidance goals* which are associated with a focus on concealing failure for avoiding displaying lack of

competence (Ames, 1992; Dweck & Leggett, 1988; Elliot & Church, 1997; Middleton & Midgley, 1997; Nicholls, 1984). Research showed that these goals relate with each other according to a specific pattern: Performance-approach goals tend to be positively associated with both mastery and performance-avoidance goals, which in turn seem unrelated to each other (Dinger, Dickhäuser, Spinath, & Steinmayr, 2013; Elliot & Church, 1997; Elliot & McGregor, 2001; Pajares, Britner, & Valiante, 2000; Pajares & Valiante, 2001). This pattern is well explained by the achievement goal theory (Dweck & Leggett, 1988; Elliot & Church, 1997). Master and performance-approach goals may be related to each other because both of these goals seem representative of an approach tendency towards the attainment of positive outcomes. The performance-approach and performance-avoidance goals are different dimensions in the approach-avoidance classification. However, they are argued to be related in that they share a focus on comparing own competence with that of other people. Indeed, before the trichotomous model of achievement goals, these two types of goals were subsumed under a single orientation labelled "performance goals".

Beliefs in skills malleability and achievement goals

Dweck and colleagues theorized that students' goal orientations are rooted in their beliefs about skills malleability (Dweck, 1986, 1999; Dweck & Leggett, 1988). In particular, students holding incremental beliefs tend to adopt mastery goals, whereas students holding entity beliefs tend to adopt performance-avoidance goals (Blackwell et al., 2007; Chen & Pajares, 2010; Robins & Pals, 2002). These correlational findings have been complemented by experimental studies. For example, undergraduates who read an article portraying intelligence as an incremental (vs. fixed) skill reported higher orientations toward mastery goals and lower orientations toward performance-avoidance goals (Cury, Elliot, Fonseca, & Moller, 2006; Dinger & Dickhäuser, 2013; see also, Dinger et al., 2013). Research evidence, however, is not consistent regarding the relationship between beliefs in skills malleability and performance-approach goals. Whereas some studies found a positive link (e.g., Chen & Pajares, 2010; Cury et al., 2006), meta-analysis findings do not find consistent evidence that these beliefs are associated with performance-approach goals (Burnette et al., 2013).

Outcomes of achievement goals

Particularly in challenging situations, students' goal orientations seem to impact performance by creating more or less adaptive learning patterns (Dweck, 1999; Dweck & Leggett, 1988). Research has widely documented that mastery goals are typically associated with mastery-oriented learning patterns, including use of deep strategies, self-regulation, effort and persistence, task value and enjoyment, less procrastination, positive affect, high self-efficacy and self-esteem, and high achievement (Blackwell et al., 2007; Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2015; Diseth & Kobbeltvedt, 2010; Linnenbrink, 2005; Meece, Herman, & McCombs, 2003; Wolters &

Fan, 2013). On the contrary, performance-avoidance goals have been found to be associated with helpless learning patterns, including use of surface strategies, low task engagement and enjoyment, hopeless, unwillingness to seek help, test anxiety, negative affect, low self-efficacy and self-esteem, and low achievement (Diseth & Kobbeltvedt, 2010; Elliot & Church, 1997; Elliot & Harackiewicz, 1996; Middleton & Midgley, 1997; Robins & Pals, 2002; Sideridis, 2003). Again, results are not straightforward regarding performance-approach goals. In a literature review Elliot and Moller (2003) revealed that studies examining the association of performance-approach goals with learning processes and outcomes showed either positive effects (e.g., competence valuation, effort), null effects (e.g., deep processing, self-regulated learning), or both positive and null effects (e.g., self-efficacy, performance attainment). Nonetheless, there was no reliable evidence showing negative effects of performance-approach goals, at least for the measures that they considered. A meta-analysis suggested that these inconsistencies in the literature seem associated to the variability that exists concerning the operationalization of the construct (Hulleman, Schrager, Bodmann, & Harackiewicz, 2010). In particular, we found that the relationship between performance-approach goals and performance outcomes was positive when the items tapped normative aspects (i.e., trying to do better than others), but negative when they tapped appearance aspects (i.e., trying to look good to others).

To sum up, there is an overall agreement that students' achievement goals impact students' performance mostly by setting specific learning patterns, including both cognitive and motivational mechanisms. Among the latter are self-efficacy beliefs, whose mediating role in the goals-performance relationship in the writing domain is studied in the research that we report in this paper.

1.3 Self-Efficacy Beliefs

In the school context, self-efficacy refers to students' perceptions about their ability to successfully learn or perform academic tasks (Bandura, 1982, 1997). Within the field of writing motivation, self-efficacy is perhaps the most studied variable (Pajares, 2003). Whereas the majority of past studies portrayed self-efficacy as a unitary construct (e.g., Pajares & Valiante, 1999; Shell, Murphy, & Bruning, 1989), recent studies showed the advantages of using multidimensional measures tapping self-efficacy to accomplish specific writing processes (Bruning, Dempsey, Kauffman, McKim, & Zumbrunn, 2013; Sanders-Reio, Alexander, Reio, & Newman, 2014). Bruning et al. (2013) found empirical support for a model with three first-order factors comprising self-efficacy for conventions (i.e., translating ideas into linguistic forms and transcribing them into writing), ideation (i.e., generating good ideas for writing and ordering them), and self-regulation (i.e., managing the cognitive, emotional, and behavioral aspects of writing). Even though not closely aligned with specific academic domains, the assessment of self-efficacy for self-regulation is not new (Zimmerman & Bandura, 1992). Indeed, students' effective use of self-regulation strategies, which is crucial in writing (Graham

& Harris, 2000), rests as much in *knowing* the strategies as in *believing* these can be used effectively (Zimmerman & Risemberg, 1997).

Achievement goals and self-efficacy

As noted above, self-efficacy is associated with students' goal orientations. At different school levels and academic domains it was found that self-efficacy was positively associated with mastery goals and, to a lesser extent, negatively associated with performance-avoidance goals (Kauffman et al., 2010; Mason et al., 2013; Meece et al., 2003; Pajares et al., 2000; Pajares & Valiante, 2001). When self-efficacy for self-regulation is specifically considered, the positive association between mastery goals and self-efficacy is even stronger (Pajares et al., 2000; Pajares & Valiante, 2001). This finding makes sense to the extent that self-regulated learning seems to be an integral part of mastery-goal orientations (Kaplan, Lichtinger, & Gorodetsky, 2009). As for self-efficacy and performance-approach goals, these were found to hold positive (Chatzistamatiou et al., 2015; Kauffman et al., 2010; Pajares et al., 2000, Exp. 1), or null associations (Chen & Pajares, 2010; Middleton & Midgley, 1997; Pajares et al., 2000, Exp. 2). Importantly, studies have shown that self-efficacy, both in general (Mason et al., 2013; Muis & Foy, 2010; VandeWalle, Cron, & Slocum Jr., 2001) and for self-regulation (Chen & Pajares, 2010), mediate the link between mastery goals and performance. In other words, it seems that one of the mechanisms through which a stronger orientation towards mastery goals is associated to better performance is by providing students with high levels of confidence in their abilities to achieve those goals.

Self-efficacy and performance

Students' self-efficacy beliefs are important forces for successful academic performance across schooling (Bandura, 1982, 1997; Zimmerman & Bandura, 1994). High self-efficacy seems to foster performance by prompting adaptive learning behaviors, such as high effort, persistence, cognitive engagement, and self-regulation (Bandura, 1997; Pintrich, 2000b; Pintrich & De Groot, 1990; Wolters & Fan, 2013). The relationship between self-efficacy and performance is also evident in writing. Students' perceptions of ability were found to be among the strongest predictors of writing performance (e.g., Limpo & Alves, 2013a; Pajares, Miller, & Johnson, 1999; Pajares & Valiante, 1997, 1999). This effect was also observed when self-efficacy focused on specific dimensions, such as conventions, ideation, and self-regulation. Still, stronger effects were reported for self-efficacy for conventions than for ideation or self-regulation (Bruning et al., 2013; Sanders-Reio et al., 2014).

1.4 Present Study

The purposes of this study were twofold. First, we intended to provide further validity and reliability evidence on recent scales measuring beliefs in skill malleability (Limpo &

Alves, 2014), achievement goals (Kauffman et al., 2010), and self-efficacy (Bruning et al., 2013) in writing. Second, we sought to examine associations among these constructs and writing performance in middle-grade students. We used path analysis to test the assumption that beliefs in writing skill malleability impact performance, via achievement goals and self-efficacy (cf. Figure 1). Although grounded on the theoretical and empirical evidence previously reviewed, this model has not been tested before in writing or in other fields. The hypotheses and a summary of the rationale underlying each path specified in the model are as follows.

Paths from beliefs in writing skills malleability to achievement goals

Based on the well-documented link between beliefs in skills malleability and achievement goals (Blackwell et al., 2007; Dinger & Dickhäuser, 2013; Dweck & Leggett, 1988), we predicted that stronger entity writing beliefs would contribute negatively to mastery goals and positively to performance-avoidance goals. Although a meta-analysis indicated that beliefs in skills malleability did not predict performance-approach goals (Burnette et al., 2013), this path was specified because some studies found the opposite (Chen & Pajares, 2010).

Paths from achievement goals to self-efficacy

Similar to other findings reporting an association between achievement goals and self-efficacy (Kauffman et al., 2010; Middleton & Midgley, 1997; Pajares et al., 2000), we anticipated that mastery and performance-avoidance goals would have, respectively, positive and negative effects on all self-efficacy dimensions. Given the mixed results involving performance-approach goals and self-efficacy, showing either positive, or negative relationships (Elliot & Moller, 2003), though some association was expected, no specific hypotheses were put forward concerning its direction.

Paths between achievement goals

Aligned with achievement goal theory, suggesting that performance-approach and mastery goals are grounded on approach tendencies and that performance-approach and performance-avoidance goals share a focus on ability (Elliot & Church, 1997), we expected performance-approach goals to correlate positively with both mastery and performance-avoidance goals. No relation was however expected between mastery and performance-avoidance goals.

Paths between self-efficacy dimensions

In line with Bruning et al. (2013), suggesting that self-efficacy for conventions, ideation, and self-regulation are distinctive but related dimensions, these three variables were hypothesized to be strongly associated with each other.

Paths from self-efficacy to writing performance

Given consistent research showing that student' self-efficacy beliefs – considered as either a unitary (Pajares et al., 2000) or a multifactor construct (Bruning et al., 2013) – predict writing performance, we anticipated that all self-efficacy dimensions would contribute to writing performance.

1.5 Contributions to Extant Research

This study may advance research on writing beliefs by providing further evidence on the mechanisms underlying the association of students' beliefs in writing skill malleability with writing performance. Actually, only a few studies explicitly tested mediators explaining this relation (Blackwell et al., 2007; Chen & Pajares, 2010). However, these studies neither tested the shared and unique relationships between beliefs in skills malleability, achievement goals, self-efficacy, and performance, nor focused on the writing domain. Findings will be particularly innovative regarding beliefs about writing skill malleability. Excepting Limpo and Alves's (2014) study, these beliefs have not been subjected to empirical inquiry within the field of writing. This is a noticeable omission considering the influential role of these beliefs in shaping academic performance (Blackwell et al., 2007) and the increasing number of studies placing motivation as a critical catalyst for writing development (Boscolo & Hidi, 2007; Bruning & Horn, 2000). This study may therefore provide insights into the drives underlying the development of good writing skills, which may, ultimately, guide the development of interventions addressing students' beliefs in writing skill malleability. The effectiveness of such evidence-based interventions was already shown in other academic domains (e.g., Blackwell et al., 2007; Good et al., 2003). A final methodological contribution is worth highlighting. Results may add to the ongoing validation process of recent writing-specific instruments to measure beliefs in writing skill malleability, achievement goals, and self-efficacy. Validity evidence will strengthen the appropriateness and meaningfulness of the inferences derived from their scores in this study and others as well.

2. Method

2.1 Participants

Excepting 12 students with special education needs, all 7th- and 8th-graders enrolled in a public cluster of schools in Porto and attending classes during the period of data collection participated in the study (N = 196, total of 10 classes). Participants were all native Portuguese speakers, with a mean age of 13.7 years (SD = 0.9, age range = 12.2–16.9; 112 girls). This cluster of schools was chosen by convenience, but, as described next, it mirrors national statistics for socioeconomic status and school achievement. As a proxy for students' socioeconomic status, we used their mothers' educational level, which was as follows (values within parentheses represent 2015 national statistics

extracted from Fundação Francisco Manuel dos Santos, 2016): 10% completed Grade 4 or less (23%), 33% completed Grade 9 or less (27%), 25% completed high school (19%), 30% completed college or some postgraduate study (20%), and 3% was unknown (11%). Students' school achievement was measured through their previous marks for Portuguese and Mathematics, given in a 5-point scale (1 = *lowest score* and 5 = *highest score*). Respectively, average marks for these courses were 3.1 (*SD* = 0.7) and 3.0 (*SD* = 0.9), with national averages being 3.2 and 3.1 (Direção Geral da Educação, 2015). The sample included 47 students who repeated a grade at least once. Even though this group of students with retentions was older (M_{age} = 14.9, *SD* = 0.8), their mothers' educational level, school achievement, and scores on this study's variables (viz., beliefs in writing skill malleability, achievement goals, self-efficacy, and writing performance) did not differ from the rest of the sample. In all measures, the group with retentions scored within ±1 *SD* of the average of the group without retentions.

2.2 Instructional Setting

In Portugal, basic education comprises three stages: Grades 1–4 (age 6–10), Grades 5–6 (age 10–12), and Grades 7–9 (age 12–15). Participants were thus attending the two initial years of the third stage, in which they have 11 courses taught by different teachers. Writing is the preferred learning and assessment tool across all courses, but explicit writing instruction only occurs in Portuguese language classes. Though there is some national variability, third-stage Portuguese language typically occur four times a week and last 50 min. Teachers organize class time autonomously around oral language, reading, and writing (Buesco, Morais, Rocha, & Magalhães, 2015). Writing instruction is predominately devoted to the teaching of grammar based on traditional whole-class methods and to independent text production of multiple genres (e.g., argumentative texts, expository texts, poems, syntheses). Teachers are recommended to adopt a process-oriented approach to text production, but few guidelines are provided on how to explicitly teach major cognitive writing processes (e.g., planning) or support students' motivation to write (Niza, Segura, & Mota, 2011). Also, due to the extensiveness of the curriculum, there are limited opportunities for individualized feedback and progress monitoring during writing practice.

2.3 Procedure

Tasks were administered in classroom groups with about 20 students, during class time and at the end of the academic year. Students were informed that participation was voluntary and results were confidential, with no impact on their marks. All students agreed to participate. The administration session lasted 75 min and comprised two parts with a 10-min break to avoid fatigue. In the first part, students performed a set of writing-related tasks (e.g., sentence and vocabulary exercises) as part of a larger project on cognitive writing processes (Limpo, Alves, & Connelly, 2017), which goes beyond the scope of the present study.

In the second part of the session students performed the tasks relevant to this study. Students began by filling out the scales measuring beliefs in writing skill malleability (Limpo & Alves, 2014) and writing achievement goals (Kauffman et al., 2010). To allow close temporal proximity of the self-efficacy assessment to the writing outcome, the experimenter first presented the prompt of the opinion essay, and then asked students to fill out the scale measuring self-efficacy (Bruning et al., 2013). For the three scales, the experimenter indicated that there were no right or wrong answers and explained the overall procedure. Items were read aloud to students, who completed the instruments simultaneously and one item at a time. Afterwards, the experimenter gave students a blue sheet and explained that before writing the text they would have 3 min to write down everything that could help them to write the text (for similar procedures, see Berninger, Whitaker, Feng, Swanson, & Abbott, 1996; Limpo & Alves, 2013b). All students used these sheets properly and provided a written plan. Students were then given 5 min to write the text, and were notified 2.5 and 1 min before the end of the time limit. To control for potential prompt effects, half of the classes wrote the essay to the prompt "Do you think teachers should give students homework every day?" and the other half to the prompt "Do you think students should have extracurricular activities every day". Classes were randomly assigned to the prompts within each grade and there were no differences between groups writing to different prompts in any of the variables. Based on prior research, these prompts were deemed equivalent and appropriate to middle-grade students (Limpo & Alves, 2013b). They were chosen for their interest value for Portuguese middle graders, thereby maximizing task engagement and productivity.

2.4 Measures

Beliefs in writing skill malleability

Students' beliefs in writing skill malleability were measured with the Implicit Theories of Writing Scale, developed by Limpo and Alves (2014). The scale has 3 items measuring students' beliefs about the malleability of their writing ability. Students were asked to rate their level of agreement with each sentence using a scale ranging from 1 (*completely disagree*) to 6 (*completely agree*), with higher scores indicating stronger beliefs in writing skill malleability. In two studies, Limpo and Alves (2014) reported Cronbach's alphas of .69 and .76 in Grades 5-6.

Achievement goals

Students' achievement goals were measured with the Writing Achievement Goals Scale, developed by Kauffman et al. (2010), which was adapted to the Portuguese language. The scale has 12 items measuring students' motivational orientations to pursue three categories of goals: mastery, performance approach, and performance avoidance. Answers were given in a scale ranging from 1 (c*ompletely disagree*) to 5

(*completely agree*), with higher scores meaning a stronger orientation toward the respective goal. Kauffman et al. (2010) reported Cronbach's alphas of .84, .81, and .75 for mastery, performance-approach, and performance-avoidance goals in Grade 8.

Self-efficacy

Students' self-efficacy beliefs were measured with the Self-Efficacy for Writing Scale, developed by Bruning et al. (2013), which was adapted to the Portuguese language. The scale has 16 items measuring students' confidence about being able to accomplish specific writing processes in three domains: conventions, ideation, and self-regulation. Answers were given in a scale ranging from 0 (*no chance*) to 100 (*completely certain*), with higher scores indicating higher self-efficacy. Bruning et al. (2013) reported Cronbach's alphas of .85, .90, and .88 for conventions, ideation, and self-regulation in Grade 8.

Writing performance

The quality of the opinion essays was used as an indicator of writing performance. Brief 5-min writing tasks have been used extensively in prior writing research (Berninger et al., 1996; Connelly, Dockrell, Walter, & Critten, 2012; Graham, Berninger, Abbott, Abbott, & Whitaker, 1997; Kent, Wanzek, Petscher, Al Otaiba, & Kim, 2014), including curriculum-based measurement research (Espin et al., 2000), with proved validity (Dockrell, Connelly, Walter, & Critten, 2015; Lembke, Deno, & Hall, 2003). Two graduate research assistants, blind to study purposes, rated the overall quality of the opinion essays using a holistic rating rubric (Cooper, 1977). To avoid biased judgments all texts were previously typed and corrected for spelling, punctuation, and capitalization errors (Berninger & Swanson, 1994). Judges were told to read each essay carefully and to form a general impression of writing quality considering four factors equally: quality of ideas (i.e., originality and relevance of the ideas), organization (i.e., coherence and organization of the text), sentence structure (i.e., syntactic correctness and diversity of the sentences), and vocabulary (i.e., diversity, interest, and proper use of the words). Quality scores were given on a 7-point scale ranging from 1 (*low quality*) to 7 (*high quality*). Several previous studies demonstrate the validity of this procedure to assess writing quality (e.g., Graham, Harris, & Fink-Chorzempa, 2000; Harris, Graham, & Mason, 2006; Limpo & Alves, 2013a).

Before assessing participants' opinion essays, judges were trained in using the holistic rubric. Initially, the trainer explained the four above-mentioned factors, presented anchor essays representing low-, middle-, and high-quality scores, and discussed the distinctive features of anchor points. Afterwards, judges practiced applying the scale collaboratively under the trainer's guidance. As soon as the rating procedure was fully understood, judges rated a set of essays independently. Scores were then compared and disagreements were resolved through discussion. After achieving full agreement, judges started rating participants' opinion essays. Anchor and

practice essays were collected from seventh- and eighth-grade students not involved in the study. As the Intraclass Correlation Coefficient showed high agreement between judges (.91), the final score for writing performance was the average across judges.

3. Results

3.1 Overview of Data Analysis

Analyses were conducted with the R system for statistical computing (R Development Core Team, 2005). Since data collection occurred in classroom groups, for confirmatory factor analyses (CFA) and path analyses, we used the lavaan.survey package, which allows structural equation modeling analyses of clustered data (Oberski, 2014). The method of estimation was maximum-likelihood with robust standard errors, which takes into account not only the non-independence of the observations but also any effects of non-normality. To evaluate models fit we used the chi-square statistic (χ^2), the confirmatory fit index (CFI), and the root-mean-square error of approximation (RMSEA). CFI values greater than .95 and .90, and RMSEA values less than .06 and .10 are considered good and adequate fits, respectively (Hu & Bentler, 1999).

3.2 Scales Validity and Reliability

CFA was used to examine the factorial validity of the three scales. Before models evaluation, the variance of the latent factors was constrained to 1.0, so that all items' factor loadings could be freely estimated. Table 1 reports descriptive statistics and factor loadings of the final models.

Beliefs in Writing Skill Malleability

In the CFA model, all items were specified to load on a single factor. As this model was just identified, residual variances of items 1 and 2, which were very similar (0.30 and 0.29, respectively), were constrained to be equal. CFA results showed that this model fitted the data extremely well $\chi^2(1, N = 196) = 2.293$, $p = .97$, CFI = 1.000, RMSEA = .000, p(RMSEA ≤ . 05) = 1.000. An inspection of modification indices (MIs) showed no problems at the item level (MIs < .003). As displayed in Table 1, skewness and kurtosis were below |1.22|, suggesting no distributional problems. The CFA revealed that items 1, 2, and 3 had moderate to strong factor loadings (respectively, .91, .91, and .51, ps < .001) and item-total correlations (respectively, .76, .77, and .49). The average of inter-item correlations was adequate (r = .59) and the scale's internal consistency was also good (α = .81).

Writing Achievement Goals

In the CFA model, items were specified to load on the respective scales, which were specified to correlate with each other. CFA results did not show a very good fit of the model to the data, $\chi^2(51, N = 196) = 131.241$, $p < .001$, CFI = .880, RMSEA = .090, $p(\text{RMSEA} \leq .05) < .001$. An examination of MIs revealed the presence of covariance between the errors terms of items 4 and 12 of the performance-approach scale (MI = 39.57), which could be the source of model misspecification[2]. A closer look at these items indicated they shared an underlying idea, that of being better than others, which could explain the observed measurement error covariance. Hence, based on statistical and methodological criteria, we correlated these error terms. After this respecification CFA results showed that the three-factor model had an adequate fit to the data, $\chi^2(50, N = 196) = 94.985$, $p < .001$, CFI = .930, RMSEA = .068, $p(\text{RMSEA} \leq .05) = .070$. As detailed in Table 1, skewness and kurtosis were below |1.73|, suggesting no distributional problems. Factor loadings ranged from .45 to .85 (all *p*s < .001) and item-total correlations were appropriate (.37 < *r*s < .70). We also found good average inter-item correlations ($r_{\text{mastery}} = .40$; $r_{\text{approach}} = .39$; $r_{\text{avoidance}} = .49$) and internal consistency values ($\alpha_{\text{mastery}} = .73$; $\alpha_{\text{approach}} = .72$; $\alpha_{\text{avoidance}} = .79$). The performance-approach scale correlated with both the mastery and performance-avoidance scales (respectively, $r = .73$ and $r = .62$, *p*s < .001).

Self-Efficacy for Writing

In the CFA model, items were specified to load on the respective scales, which were specified to correlate with each other. CFA results showed that this three-factor model fitted the data extremely well, $\chi^2(101, N = 196) = 108.3$, $p = .291$, CFI = .992, RMSEA = .019, $p(\text{RMSEA} \leq .05) = 1.000$. As reported in Table 1, skewness and kurtosis were below |1.75|, suggesting no distributional problems. Factor loadings ranged from .51 to .88 (all *p*s < .001) and item-total correlations were appropriate (.40 < *r*s < .81). We also found good average inter-item correlations ($r_{\text{conventions}} = .51$; $r_{\text{ideation}} = .68$; $r_{\text{self-regulation}} = .55$) and internal consistency values ($\alpha_{\text{conventions}} = .84$; $\alpha_{\text{ideation}} = .91$; $\alpha_{\text{self-regulation}} = .88$). The three self-efficacy dimensions correlated with each other (.67 < *r*s < .74, *p*s < .001).

Correlation between scales

Table 2 displays descriptive statistics and correlations between all study variables. Composite scores for beliefs in writing skill malleability, achievement goals, and self-efficacy were computed by averaging the respective items. Three results are noteworthy: beliefs in writing skill malleability correlated negatively with mastery goals and with all self-efficacy dimensions as well as positively with performance-avoidance goals; mastery goals displayed stronger correlations with self-efficacy than performance goals; and, except for performance goals, all scales were correlated with writing performance.

Table 1. Descriptive statistics and parameter estimates for each item of the scales measuring beliefs in writing skill malleability, achievement goals, and self-efficacy

Items	M	SD	Sk	K	Item-Total correlations	B	SE	β
Implicit Theories of Writing (α = .81)								
My texts will always have the same quality, no matter how much I try to change it.	2.69	1.30	0.35	-0.44	.76	1.18	0.06	.91
No matter how many texts I write, their quality will always be the same.	2.58	1.34	0.58	-0.34	.77	1.22	0.07	.91
I can't change the quality of my texts.	2.02	1.21	1.22	1.13	.49	0.62	0.10	.51
Achievement Goals (When I'm writing in my English/Language arts class, I'm trying to...)								
Mastery (α = .73)								
become a better writer.	3.72	0.90	-0.57	0.42	.49	0.56	0.10	.63
learn to choose words that best express my ideas.	4.16	0.80	-1.03	1.73	.56	0.52	0.07	.66
improve how I express my ideas.	4.34	0.72	-1.02	1.66	.54	0.48	0.04	.67
better organize my ideas.	4.24	0.68	-0.55	0.05	.48	0.39	0.05	.58
Performance approach (α = .72)								
impress my teacher with my writing.	3.68	0.99	-0.59	-0.03	.44	0.60	0.06	.61
be a better writer than my classmates.	2.46	1.16	0.32	-0.72	.62	0.59	0.09	.51
show off my writing skills.	4.15	0.75	-0.70	0.81	.37	0.44	0.05	.59
be the best writer in my class.	2.61	1.32	0.24	-1.08	.67	0.73	0.09	.56
Performance avoidance (α = .79)								
hide that I have a hard time writing.	2.38	1.13	0.42	-0.62	.42	0.50	0.07	.45
keep people from thinking I'm a poor writer.	3.04	1.17	-0.15	-0.75	.66	0.92	0.06	.79
keep my teacher from thinking I'm not very smart.	2.89	1.17	-0.01	-0.65	.70	0.99	0.09	.85
avoid looking foolish in front of my classmates.	2.83	1.32	0.05	-1.08	.64	0.95	0.11	.72
Self-Efficacy								
Conventions (α = .84)								
I can spell my words correctly.	77.78	20.44	-1.37	1.75	.65	14.44	1.89	.71
I can write complete sentences.	79.24	18.39	-1.04	0.77	.68	13.69	1.44	.75
I can punctuate my sentences correctly.	72.27	21.87	-0.88	0.36	.66	16.33	2.55	.75
I can write grammatically correct sentences.	71.72	22.75	-0.93	0.54	.79	20.04	2.00	.88
I can begin my paragraphs in the right spots.	80.00	22.99	-1.37	1.59	.46	11.75	2.85	.51

Ideation (α = .91)								
I can think of many ideas for my writing.	73.67	23.24	-1.06	0.67	.74	17.78	1.32	.77
I can put my ideas into writing.	74.92	21.05	-1.12	1.15	.76	17.05	1.58	.81
I can think of many words to describe my ideas.	68.51	21.63	-0.90	0.56	.81	18.40	0.84	.85
I can think of a lot of original ideas.	70.39	23.37	-1.00	0.52	.81	19.87	1.50	.85
I know exactly where to place my ideas in my writing.	69.28	22.34	-0.84	0.48	.77	18.46	2.19	.83
Self-Regulation (α = .88)								
I can focus on my writing for at least one hour.	61.74	28.09	-0.45	-0.64	.59	18.23	1.33	.65
I can avoid distractions while I write.	66.59	29.09	-0.80	-0.41	.74	22.46	1.70	.77
I can start writing assignments quickly.	68.06	23.52	-0.76	0.13	.79	20.22	1.97	.86
I can control my frustration when I write.	70.20	27.79	-0.98	0.08	.68	20.08	1.96	.73
I can think of my writing goals before I write.	71.37	24.69	-1.01	0.56	.65	17.64	2.07	.72
I can keep writing even when it's difficult.	71.11	26.83	-1.09	0.44	.66	19.45	2.63	.73

Table 2. Descriptive statistics for and bivariate correlations between all variables

	2.	3.	4.	5.	6.	7.	8.	*M*	*SD*	*Sk*	*K*
1. Beliefs in writing skill malleability	.45***	.05	-.19**	.24***	.34***	.32***	.20**	2.43	1.09	0.47	-0.32
2. Mastery goals		.39***	-.05	.32***	.38***	.49***	.28***	4.11	0.57	-0.77	0.53
3. Performance-approach goals			.48***	.14	.24***	.30***	.12	3.23	0.80	0.03	-0.54
4. Performance-avoidance goals				-.10	-.02	-.01	.01	2.79	0.94	0.04	-0.59
5. Self-efficacy for conventions					.58***	.62***	.28***	76.20	16.63	-1.06	1.08
6. Self-efficacy for ideation						.68***	.24***	71.35	19.22	-1.02	0.95
7. Self-efficacy for self-regulation							.28***	68.18	21.02	-0.91	0.53
8. Writing performance								3.70	1.25	0.06	-0.48

** $p < .01$. *** $p < .001$.

Path Analysis Results

The hypothesized relationships among variables were evaluated with path analysis. Results showed that the proposed model fitted the data extremely well, $\chi^2(8, N = 196) = 16.71$, $p = .033$, CFI = .978, RMSEA = .075, p(RMSEA ≤ .05) = .181, explaining 10% of the variability in writing performance. Figure 1 displays standardized betas for direct effects. Except the path from beliefs in writing skill malleability to performance-avoidance goals, none of the paths involving performance goals reached statistical significance. As for indirect effects, results showed that beliefs in writing skill malleability contributed to self-efficacy for conventions ($\beta = -.12$, $p = .01$), ideation ($\beta = -.14$, $p = 01$), and self-regulation ($\beta = -.19$, $p = .001$), via mastery goals. Additionally, mastery goals contributed indirectly to writing performance ($\beta = .07$, $p = .04$), via self-efficacy for self-regulation.

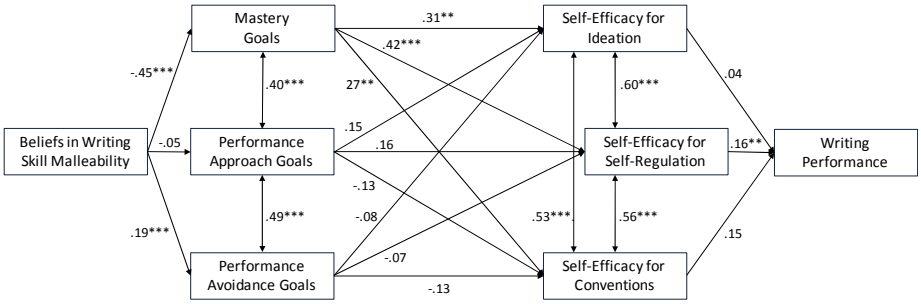

Figure 1. Representation of the proposed model tested, with standardized path coefficients (* $p < .05$; ** $p < .01$; *** $p < .001$).

3.2.6 Supplementary analyses

As recommended by Kline (2005), we evaluated two alternative models that were compared with the proposed model with a chi-square difference test. Model 1 added one path from beliefs in writing skill malleability to writing performance, and Model 2 added paths from achievement goals (viz., mastery, performance approach, and performance avoidance) to writing performance. Though these models fitted the data as well as the proposed model, none of the added paths reached statistical significance (cf. Table 3). These results suggest acceptance of the proposed model as the most parsimonious.

The proposed model was additionally compared with a third alternative model, in which we reversed the order of achievement goals and self-efficacy beliefs in the chain from beliefs in writing skill malleability to writing performance (cf. Liem, Lau, & Nie, 2008). In other words, we examined whether the contribution of beliefs in writing skill malleability on writing performance was via achievement goals and self-efficacy

(proposed model) or via self-efficacy and achievements goals (Model 3). Because these two models were not nested, chi-square difference tests were not performed. Instead, we inspected goodness-of-fit statistics along with the Akaike Information Criteria (AIC) and Bayesian Information Criteria (BIC), with smaller values indicating better models. We found that, though acceptable, the fit of Model 3 was not very good and clearly below that of the proposed model (ΔCFI = .049). We further inspected sources of misfit by looking at the modification indices (MIs) and in addition to these being higher than those of the proposed model ($MI_{Model\ 3} < 26$ vs. $MI_{Proposed} < 10$), the highest MI found in Model 3 were found for paths relating mastery goals to beliefs in writing skill malleability and self-efficacy. Moreover, Model 3 showed higher AIC and BIC values than the proposed model. Based on these results, we decided to accept the proposed model specifying a chain from beliefs in writing skill malleability to writing performance via, first, achievement goals, and, then, self-efficacy.

Table 3. Goodness-of-fit statistics for the proposed and alternate models

	Proposed model	Alternate Model 1	Alternate Model 2	Alternate Model 3
Goodness-of-fit statistics				
χ^2	16.710	16.893	10.350	44.451
df	8	7	5	8
p	.033	.018	.066	< .001
CFI	.978	.975	.987	.909
RMSEA	.075	.085	.074	.152
*P(*RMSEA<.05)	.181	.127	.218	< .001
AIC	7291.770	7291.536	7291.724	7321.042
BIC	7409.783	7412.826	7419.57	7439.054
Comparison tests				
$\Delta\chi^2$		0.183	6.360	
p		.669	.095	

Note. Model 1 added one path from beliefs in writing skill malleability to writing performance (β = .-11, p = .25). Model 2 added three paths from mastery, performance-approach, and performance-avoidance goals to writing performance (respectively, β = .20, p = .07; β = -.04, p = .46; and β = .06, p = .16). Model 3 reversed the order of the achievement goals and self-efficacy variables, therefore testing the following chain: beliefs in writing skill malleability → self-efficacy → achievement goals → writing performance.

4. Discussion

4.1 Scales Validity and Reliability

One of the main contributions of the current study was gathering evidence on the validity and reliability on a set of scales to measure beliefs in writing skill malleability, writing achievement goals, and self-efficacy for writing.

Beliefs in Writing Skill Malleability

Replicating Limpo and Alves's (2014) results, the CFA model fitted data very well and no problems at the item level were identified. Moreover, inter-item and item-total correlations, factor loadings, and scale reliability were all adequate. Importantly, as repeatedly found in this field of research, stronger incremental beliefs were associated with stronger mastery goals, whereas stronger entity beliefs were associated with stronger performance-avoidance goals (for a meta-analysis, see Burnette et al., 2013). Although it could be argued that the reduced number of items (i.e., three) may threaten the validity of this scale, we do not think this is the case. Indeed, the validity of an instrument cannot be judged upon the number of items. On the contrary, it is more deeply evaluated by evidence supporting the meaningfulness of its scores (cf. Messick, 1995). The meaningfulness of the scores derived from the scale measuring beliefs in writing skill malleability is rooted in the following: The rationale underlying scale's development and its reliance on the 3-item scale proposed by Dweck, prior validity evidence from Limpo and Alves (2014); current CFA results showing good factor loadings and an excellent model fit, lack of problems at the item level; replication of prior results using the scale; and the path analysis' findings discussed later, which are aligned with results across different domains. Though the validation of this scale is a work in progress, available evidence supports the validity and reliability of the instrument to measure students' beliefs in skills malleability in the writing domain.

Writing Achievement Goals

CFA results showed that the three-factor model fitted the data well. Furthermore, inter-item and item-total correlations, factor loadings, and reliability of each factor were adequate. It is worth noting, however, that two error terms of the performance-approach factor were correlated. Despite this respecification was grounded on meaningful criteria, additional research should provide cross-validation. Importantly, replicating common findings in the literature (e.g., Pajares et al., 2000), we found that performance-approach goals correlated with both mastery and performance-avoidance goals, whereas these latter were uncorrelated.

Self-Efficacy for Writing

The appropriateness of the three-factor model comprising self-efficacy for conventions, ideation, and self-regulation was confirmed by CFA results. Additionally, for the three self-efficacy dimensions, we found moderate to strong inter-item and item-total correlations, factor loadings, and reliability coefficients. Replicating previous findings (Bruning et al., 2013), we showed that, although tapping distinct processes, the three self-efficacy factors were strongly correlated with each other.

4.2 Effect of Beliefs in Writing Skill Malleability on Writing Performance

The other main purpose of this study was to examine the link between students' beliefs in writing skill malleability and writing performance, by testing the mediating role of achievement goals and self-efficacy. Path analysis showed that the proposed model was an excellent description of the data. We did find the predicted chain of links between beliefs in writing skill malleability and writing performance involving achievement goals and self-efficacy. However, this effect was only observed for mastery goals.

As anticipated, we found that students' beliefs about the malleability of their writing skill predicted the extent to which they pursued mastery goals in writing. Specifically, stronger incremental beliefs were associated with a greater orientation towards mastery goals. It seems that the more students viewed writing as an incremental skill liable to development, the more they were oriented to increasing it. This finding agrees with decades of correlational and experimental research placing beliefs in skills malleability as precursors of mastery goals (Blackwell et al., 2007; Dinger & Dickhäuser, 2013; Dweck & Leggett, 1988; Robins & Pals, 2002). Yet, this is the first time such relationship is reported in writing, using a domain-specific measure of beliefs in skills malleability.

Also in line with our predictions and past findings (Kauffman et al., 2010; Meece et al., 2003; Middleton & Midgley, 1997; Pajares et al., 2000; Pajares & Valiante, 2001), we found that mastery goals were positively associated with students' self-efficacy beliefs. Results also extended prior motivation research both in general and in writing, by showing that mastery goals contributed to students' confidence to carry out specific writing processes. It is likely that students more oriented towards mastery goals may actively strive to improve their competence, for example, by taking on challenges, working hard, and confronting deficiencies, which may give them a strong sense of efficacy to accomplish specific processes fundamental to successful writing. Specifically, the more students were oriented toward developing their writing ability, the higher their self-perceptions of ability to generate and organize ideas (ideation), translate them into text (conventions), and manage the numerous processes involved in writing (self-regulation).

Partially supporting our hypotheses, we found that self-efficacy for self-regulation, but not for conventions or ideation, contributed to writing performance. This result confirms the importance of students believing they can use self-regulation strategies to cope with the cognitive, emotional, and behavioral writing challenges (Zimmerman &

Risemberg, 1997). It seems that writers should believe they can take control of their own writing, so they can use other beliefs, skills, and knowledge strategically in the benefit of text production (Graham, 2006). These results are, however, contrary to prior research, which reported higher associations of self-efficacy for conventions with writing performance compared to self-efficacy for ideation and self-regulation (Bruning et al., 2013; Sanders-Reio et al., 2014). This dissimilarity might be explained by methodological differences related to the sample and, critically, to the assessment of writing performance. Bruning et al. (2013) assessed high-school students' writing performance through their scores on the statewide writing assessment administered one month after the self-efficacy measure. Sanders-Reio et al. (2014) assessed writing performance through undergraduates' grades on an extended homework assignment. Additionally, texts in these two studies were not typed and corrected for spelling, punctuation, and capitalization errors before evaluation, as happened in the present study. This procedure is typical in writing research and not following it might be problematic because it has been observed that poor penmanship and spelling have a negative impact on holistic assessments of text quality (Berninger & Swanson, 1994). It seems likely that the stronger association of self-efficacy for conventions and writing performance reported by Bruning et al. (2013) and Sanders-Reio et al. (2014) might have been a byproduct of not removing spelling and handwriting bias from text quality scoring. More research is needed to ascertain under which conditions some self-efficacy dimensions contribute more to writing performance than others.

It is worth noting that tests of indirect effects and comparisons of the proposed model against alternate models showed that the link between beliefs in writing skill malleability and performance seemed fully mediated by mastery goals and self-efficacy for self-regulation. Based on research suggesting that the path from beliefs in skills malleability to performance, rather than being through achievement goals and then self-efficacy as proposed here (see also Chen & Pajares, 2010; Mason et al., 2013; Muis & Foy, 2010; VandeWalle et al., 2001), could be through self-efficacy and then achievement goals (e.g., Liem, Lau, & Nie, 2008), we compared two models specifying these different predictions (viz., proposed model vs. alternate Model 3). Results confirmed that, at least in the writing domain and for sampled students, beliefs in writing skill malleability influenced writing performance via achievement goals, which, in turn, influenced self-efficacy, rather than via self-efficacy and achievement goals. This indirect effect found here was similarly reported by Chen and Pajares (2010) with sixth graders in the science domain. The relationship between holding incremental theories and displaying higher performance seems to be partly explained by a greater orientation toward improving competence, which was associated with higher self-perceptions of self-regulatory ability. Self-efficacy for self-regulation played a prominent role in our model, by being the only variable directly influencing writing performance. This finding agrees with prior research showing that writing is heavily dependent on self-regulated, strategic behaviors (Graham & Harris, 2000). These latter not only rely

on strong perceptions of self-efficacy (Zimmerman & Risemberg, 1997), but also seem to be a key element of mastery-goal orientations (Kaplan et al., 2009).

Overall, current findings strengthen Dweck's claim that the beliefs students hold about the malleability of their ability create a constellation of goals and beliefs that work together to influence performance across many domains (Dweck, 1999, 2012; Dweck & Leggett, 1988; Molden & Dweck, 2006). As shown here, it seems that middle students' mastery goals and self-efficacy for self-regulation are fundamental components of this meaning system, specifically in writing.

4.3 Performance-Approach and Avoidance Goals

Results involving performance goals were less clear-cut than those involving mastery goals. Agreeing with a recent meta-analysis (Burnette et al., 2013), beliefs in skills malleability influenced performance-avoidance goals, but not performance-approach goals. Specifically, the more students viewed writing as a fixed skill, the more they were focused on avoiding demonstrating incompetence. Still, neither performance-avoidance nor performance-approach goals influenced self-efficacy. This result is contrary to writing studies reporting negative and positive effects of, respectively, performance-avoidance and performance-approach goals on self-efficacy, although these effects were of low magnitude (Kauffman et al., 2010; Pajares et al., 2000, Exp. 1). Nevertheless, the non-significant effect of performance-approach goals on self-efficacy mirrors results in other domains (Middleton & Midgley, 1997; Pajares et al., 2000, Exp. 2).

More surprising though, was the lack of an association between performance-avoidance goals and performance, either directly or indirectly. This finding contradicts prior research showing the deleterious effects of this type of goals on academic outcomes across domains (Burnette et al., 2013), including in writing (Pajares & Cheong, 2003). This unexpected finding might be due to the characteristics of the task for measuring writing performance. It is likely that the short writing assignment, as well as its presentation as part of a research study and not integrated into a typical school assignment, was not sufficiently challenging for students to perceive it as a test of their writing ability, liable to threatening their self-worth. Consequently, the writing assignment might have not evoked the self-protective responses that typically preclude optimal outcomes among students with performance-avoidance orientations (e.g., maladaptive behaviors and negative beliefs). It seems that the measurement of writing performance through more prolonged and demanding writing tasks, integrated within students' school activities and, eventually, with implications for their grades, would have been needed to observe a negative association between performance-avoidance goals and writing performance.

All in all, given the mixed findings involving performance goals, likely due to the variability in tested models, measures used, and age groups sampled, it looks premature to conclude from our data that performance goals, either with approach or avoidance tendencies, do not affect writing self-efficacy, or that they ultimately do not play a role

in students' writing performance. Indeed, this relationship might be more complex than conceptualized here, involving moderators absent from our model, such as students' age, task difficulty, or characteristics of writing instruction.

4.4 Future Research

Current findings join those of Limpo and Alves (2014) in confirming the validity of a scale measuring beliefs in writing skill malleability. Validation is an on-going process and further empirical evidence is warranted. This might be achieved by testing the scale's temporal stability, examining its psychometric properties across languages and age groups, and analyzing the relationship of beliefs in writing skill malleability with other constructs that research has shown to be closely linked to these beliefs in other domains. These may include effort beliefs (Blackwell et al., 2007), mastery vs. helpless response patterns (Robins & Pals, 2002), or coping strategies (Doron, Stephan, Boiché, & Le Scanff, 2009).

Further research may also test the path-analytic model tested in this study across different groups and text genres. Given the developmental nature of writing ability (Berninger & Swanson, 1994) it would be important to test the path model at different points in writing development. It would be particularly insightful to conduct longitudinal studies aimed at examining the effects of beliefs in writing skill malleability in the process of learning to write, rather than on writing performance at a single time point as here done. Such longitudinal results would also allow a deeper understanding of the motivational mechanisms underlying that relationship and how they relate with each other. Moreover, the role of past performance, which was not considered here, could be examined by comparing the model across low and high achievers. Since gender differences in writing seem associated with motivation (Pajares & Valiante, 2001), it would also be worthwhile to examine whether reported effects hold for both males and females. Another avenue for future research is to expand the current path model. Based on the documented relation of self-regulation to both achievement goals and self-efficacy (Kaplan et al., 2009; Zimmerman & Risemberg, 1997), writing researchers could examine the likely mediating role of self-regulation strategies in the effects of mastery goals and self-efficacy on writing performance. Finally, the inclusion of measures of teachers' beliefs and writing practices may also help to develop understanding of the role played by teachers in shaping students' beliefs.

4.5 Educational Implications

An important message of the present study is that students' writing performance depends partly on their beliefs in writing skill malleability, achievement goals, and self-efficacy. Therefore, these motivation-related aspects cannot be overlooked in the teaching of writing (Alves & Limpo, 2015). Such claims have been receiving more and more research support (Boscolo & Hidi, 2007; Bruning & Horn, 2000). As teachers manage the learning context, decide on writing assignments, and react to students' behaviors and feelings, teachers are in a privileged position to nurture incremental

views of ability particularly by creating mastery goal structures in the classroom as well as by fostering realistic and strong self-efficacy beliefs, particularly focused on self-regulation. There is now considerable evidence showing that this can be achieved by proposing challenging and meaningful assignments, providing frequent opportunities for success, emphasizing the process of learning, stressing self-improvement over social comparisons, giving regular progress feedback, praising for effort rather than for ability, and promoting students' sense of autonomy (Ames, 1992; Mueller & Dweck, 1998; Urdan & Schoenfelder, 2006). Specifically in the writing domain, these instructional features were already acknowledged as catalysts for success within the Self-Regulated Strategy Development model (Harris & Graham, 2009), which is one of the most effective instructional models for teaching writing (Graham, McKeown, Kiuhara, & Harris, 2012; Graham & Perin, 2007). A distinctive feature of this approach is, precisely, putting as much stress on fostering cognitive writing skills as on nurturing supportive motivation-related beliefs. The cognitive skill and the motivational will are two sides of the same coin. If we want our students to be good – that is, capable and motivated – writers both sides must be tackled in parallel.

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Notes

1. Though a discussion of different conceptualizations of achievement goals is beyond the scope of the current manuscript, a couple of extensions to this trichotomous model are worth mentioning. Elliot and colleagues have additionally proposed the incorporation of the approach-avoidance distinction into mastery goals resulting in a 2 x 2 achievement goal model (Elliot & McGregor, 2001) as well as the combination of the approach-avoidance distinction with three basic evaluative standards (viz., task, self, and other) resulting in a 3 x 2 achievement goal model (Elliot, Murayama, & Pekrun, 2011). These alternative achievement goals models do not put into question the validity of the trichotomous model, which was adopted here. This is a well-established model and one of the most currently used and valuable in school contexts (Pekrun, Elliot, & Maier, 2009).
2. Alternatively, it could be argued that the source of misfit could be related to the grouping of items focused on normative aspects (items 2 and 8) together with items focused on appearance aspects (items 4 and 12) in the performance-approach factor (cf. Hulleman et al., 2010). However, a new model, specifying items 2 and 8 as well as items 4 and 12 to load on different factors, failed to converge.

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