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Multidimensional motivation and engagement for writing: construct validation with a sample of boys

Rebecca J. Collie, Andrew J. Martin and Jen Scott Curwood

School of Education, University of New South Wales, Sydney, Australia; Faculty of Education and Social Work, University of Sydney, Sydney, Australia

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Given recent concerns around boys’ literacy, this study examined multidimensional writing motivation and engagement among boys. We explored internal and external validity of 11 adaptive (e.g. self-efficacy for writing) and maladaptive (e.g. disengagement from writing) factors of writing motivation and engagement. The sample comprised 781 male Australian high school students (aged 11–18 years). We used confirmatory factor analysis and structural equation modelling to conduct our analyses. Results confirmed the internal structure of the factors and revealed that parent education, and to a lesser degree language background, predicted several motivation and engagement factors. In addition, the adaptive motivation and engagement factors were associated positively with several writing (e.g. enjoyment of writing) and literacy outcomes (e.g. literacy achievement), whereas the maladaptive factors tended to be negatively associated. Invariance was found in the associations among the motivation and engagement factors and the outcomes across several participant subgroups (e.g. by gender, language background). There was also measurement invariance between the study’s sample and five randomly drawn samples of students from archived data on domain-general academic motivation and engagement. Combined, our analyses shed light on a domain-specific area of motivation and engagement – writing – that could benefit from an integrative multidimensional examination.

Keywords: motivation and engagement; writing; boys; construct validation

The ability to write is a core literacy skill that all students need to master to be able to function ably within society (Graham & Perin, 2007). It is also a major focus of national educational bodies. In Australia (the site of the present study), writing is included as one of four core areas assessed in the nationwide tests of student achievement (National Assessment Programme – Literacy and Numeracy [NAPLAN]; Australian Curriculum, Assessment and Reporting Authority [ACARA], 2011). Writing is also included as a core feature of national achievement tests in several others countries (e.g. Canada, Ministry of Education, n.d.; United States, National Centre for Educational Statistics, 2014). Despite this emphasis on writing performance and achievement, many students – and in particular, boys (Bourke & Adams, 2011; Watson, Kehler, & Martino, 2010) – struggle with writing (Bruning & Horn, 2000). In Australia, for example, the 2013 NAPLAN test results show that among grade 7 students, the percentage of boys writing at or above the national
minimum standard was 85%, compared with 94% for girls (ACARA, 2013b). Among grade 9 students, these differences were more pronounced. Only 76% of boys were writing at or above the national minimum standard, compared with 90% of girls (ACARA, 2013b). Thus, boys tend to have poorer outcomes than girls with respect to writing performance. As such, there is a need for more research in this area to develop understanding of boys’ experiences of writing so that their writing outcomes may be improved across the curriculum.

One method for developing understanding about boys’ writing is by examining their motivation and engagement for writing. Although research has examined this, there is a need for more empirical work to broaden knowledge of relevant dimensions of motivation and engagement for writing (Bruning & Horn, 2000; Graham, 2006). In the current study, we sought to further knowledge in this area by examining multidimensional writing motivation and engagement with particular interest in the extent to which a well-established motivation and engagement instrument (the Motivation and Engagement Scale (MES); Martin, 2007, 2009) can be applied to the area of writing. We also sought to examine the extent to which boys’ multidimensional motivation and engagement is associated with several writing-related outcomes – such as literacy achievement, but also other outcomes including goal orientation, enjoyment and participation in writing.

**Writing instruction in Australian high schools**

Prior to introducing the literature on writing motivation and engagement, it is important to discuss the context of the current study – Australian high schools – and the associated writing curriculum. In Australian high schools, students are expected to write a variety of text types including texts for interpretation, critical analysis and imaginative expression (e.g. Board of Studies, Teaching and Education Standards NSW [BOSTES], 2012). They are also required to be able to write across different media and technologies (e.g. BOSTES, 2012). The sophistication of these texts increases as students progress through high school and prepare for final (year 12) exams. For example, grade 7 students are expected to write imaginative, informative and persuasive texts for a variety of audiences, purposes and contexts, and to edit their texts for meaning (e.g. BOSTES, 2012). In contrast, grade 10 students are expected to write texts that reflect challenging and complex issues for imaginative, informative and persuasive purposes, and review, edit and refine their own and others’ texts for structure, word choice and visual features (e.g. BOSTES, 2012). Taken together, the Australian high school writing curriculum involves learning to compose a variety of text types, engage with multiple modes, and utilise diverse media, and the inherent skills that go hand-in-hand with this. In the current study, we examined Australian high school students’ reflections on their writing generally – not in relation to a particular subject, text type, mode or medium.

**Motivation and engagement for writing**

Skilled writing is a ‘tremendously complex problem-solving act involving memory, planning, text generation, and revision’ (Bruning & Horn, 2000, p. 26). As this description intimates, motivation and engagement are centrally implicated within skilled writing. When writers believe in their own self-efficacy, self-concept, competence and self-regulation, they are able to set more effective goals and improve their
‘will to write’ (Boscolo & Hidi, 2007, p. 2). To date, the bulk of research on writing motivation has focused on self-efficacy for writing (Bruning & Horn, 2000) demonstrating that it is positively associated with writing outcomes. For example, Sanders-Reio, Alexander, Reio, and Newman (2014) found that writing self-efficacy positively predicted enjoyment of writing and writing performance. In addition, Bruning, Dempsey, Kauffman, McKim, and Zumbrunn (2013) demonstrated that self-efficacy for writing was positively associated with students’ liking of writing, and self-reported and actual writing performance.

Emerging research has also examined other motivational constructs showing that more positive attitudes towards writing (Graham, Berninger, & Abbott, 2012), mastery and performance-approach writing goals (e.g. Pajares & Cheong, 2003), and autonomous motivation for writing (Brouwer, 2012) are associated with greater writing performance. Thus, it appears that writing motivation and engagement constructs are associated with an array of important writing-related outcomes. Nonetheless, the breadth of motivational concepts examined in prior research has been relatively limited (Graham, 2006) meaning that little is known about additional dimensions of writing motivation and engagement (Bruning & Horn, 2000). Thus, further research in this area is needed.

**Gender differences in writing motivation and engagement**

Much like the disparity between boys and girls in writing performance, there are also gender differences with respect to writing motivation and engagement. Pajares and Cheong (2003) found that girls tend to choose more adaptive mastery goals for writing (i.e. mastering the task), whereas boys tend to choose less adaptive performance goals (i.e. competing with other students). Moreover, girls tend to report greater self-efficacy for writing, writing self-concept, valuing of writing (Pajares & Valiante, 2001) and autonomous motivation for writing (Brouwer, 2012) than boys. Thus, boys tend to report poorer outcomes on several important motivation and engagement constructs. Moving forward, there is a need for more work that focuses on boys’ unique experiences with writing. In addition, there is a need to examine a broader array of motivational and engagement constructs to extend understanding in this area. In the current study, we do so by applying a multidimensional model of motivation and engagement that integrates several major theories and constructs.

**Multidimensional motivation and engagement model**

The Motivation and Engagement Wheel (Martin, 2007; Figure 1) is an integrative multidimensional model of domain-general (i.e. general academic) motivation and engagement. The Wheel includes 11 factors that reflect adaptive or maladaptive dimensions of motivation and engagement. The adaptive factors are (a) self-efficacy (i.e. students’ judgements of their capabilities to do well in their schoolwork); (b) valuing of school (i.e. perceptions of the importance, usefulness and relevance of schooling); (c) mastery orientation (i.e. an orientation towards developing competence and knowledge with respect to learning); (d) persistence (i.e. the extent of students’ academic application); (e) planning (i.e. the level of planning that students undertake for their schoolwork); and (f) task management (i.e. students’ ability to utilise study time effectively and determine effective studying locations and arrangements). The maladaptive factors are (g) anxiety (i.e. the extent to which feelings of
Research examining these factors using the Wheel’s (Martin, 2007) accompanying assessment tool – the MES (Martin, 2010) – has shown that they are associated with important academic outcomes, including academic achievement (Green et al., 2012; Plenty & Heubeck, 2011), class participation (Green et al., 2012), enjoyment of school (Martin, 2007), academic buoyancy (Martin & Hau, 2010) and personal best (PB) goals (Yu & Martin, 2014). A large proportion of this research has involved domain-general examinations. However, a smaller body of research has also shown that the MES factors are salient with respect to domain-specific (i.e. domain- or subject-specific) areas. For example, Plenty and Heubeck (2011) adapted the MES to assess mathematics motivation and engagement, and showed that the adapted scale had a good factor structure and was associated with mathematics achievement. Other research has demonstrated the salience of the MES in the areas

anxiety are experienced when thinking about or doing schoolwork); (h) failure avoidance (i.e. motivation to do schoolwork that is driven by a desire to avoid doing poorly or disappointing others); (i) uncertain control (i.e. students’ sense that they are unable to control future academic outcomes); (j) self-handicapping (i.e. students’ self-sabotage of their chances of success in order to have an excuse if they do poorly); and (k) disengagement (i.e. the inclination to give up in schoolwork or in relation to school more generally; see Liem & Martin, 2012; Martin, 2007 for reviews).
of science, English (Green, Martin, & Marsh, 2007), music and sport (Martin, 2008). In the current study, we sought to examine the relevance of the MES with respect to the specific skill of writing – an area that has not yet been researched.

Relevant student characteristics

It has been well established within the broader literature, that students’ socio-demographic characteristics can influence their academic motivation and engagement. In the current study, we examined five socio-demographic characteristics: age, grade, language background, parent education and parent occupation. Research has shown that each of these characteristics has been implicated in students’ motivation and engagement. For example, students in higher grades tend to report greater self-efficacy (e.g. Sanders-Reio et al., 2014), students who speak English as an additional language tend to report less adaptive motivation and engagement (e.g. Martin et al., 2013) and students with a higher social-economic status (SES: e.g. parent education and occupation) tend to report more adaptive academic motivation and engagement (e.g. Martin et al., 2013). Moving forward, there is a need to determine the extent to which these characteristics influence multidimensional writing motivation and engagement. The current study will help to shed light on this.

Writing and literacy outcomes

In addition to advancing understanding of the MES factors relevant to writing among boys, we also sought to determine the extent to which the factors are associated with important writing and literacy outcomes. More precisely, we examined associations among the writing-specific MES factors and six outcomes: PB goal orientation for writing, writing adaptability, academic buoyancy in writing, enjoyment of writing, participation in writing and prior literacy achievement. PB goal orientation for writing refers to a student’s tendency to choose writing goals that involve aiming for a level of writing performance that meets or exceeds a previous best (e.g. Martin, 2006). Adaptability for writing refers to the capacity to regulate psycho-behavioural functions in response to novel, changing, and/or uncertain writing situations (Martin, Nejad, Colmar, & Liem, 2013). Academic buoyancy in writing refers to students’ capacity to effectively deal with everyday writing setbacks and challenges (e.g. writing stress, a poor result; Martin & Marsh, 2008). Writing enjoyment refers to students’ satisfaction with writing tasks, and writing participation refers to students’ involvement in writing activities. Finally, prior literacy achievement refers to students’ self-reported results on literacy in the NAPLAN tests.

Research has shown that the MES factors are associated (positively for the adaptive factors and negatively for the maladaptive factors) with the domain-general versions of the outcomes examined here (e.g. academic buoyancy, school enjoyment; Martin & Hau, 2010). The extent to which these relationships also occur in the domain-specific area of writing and whether these are similar across different sample subgroups are two important questions that were addressed by the current study.

Comparisons with an archive sample

As noted above, gender is another construct that has been associated with academic and writing motivation and engagement. Given that we examined writing motivation
and engagement among boys, we could not examine the influence of gender. However, in order to provide some support for the broader relevance of the multidimensional model of writing motivation and engagement, we compared the findings from our boys sample with several mixed-gender samples of students who reported on their domain-general academic motivation and engagement. This provided the opportunity to examine whether the response processes of the boys on the writing motivation and engagement factors were similar to boys and girls responding to the domain-general version of the MES factors.

Overview of current study

In the current study, we sought to advance understanding of the factors relevant to multidimensional writing motivation and engagement. We examined the extent to which a well-established motivation and engagement instrument (the MES; Martin, 2007, 2009) can be applied to the domain-specific area of writing. A defining feature of the current study was that our sample comprised only boys. The decision for this sample type was made given the widespread concern over boys’ poorer outcomes in the writing domain (e.g. Bourke & Adams, 2011) and the need to develop better knowledge about their unique experiences of writing. As described in the following section, we utilised factor analysis to determine how well the 11 MES factors ‘fit’ for boys in the writing domain. In further exploring the extent to which the MES ‘works’ in the area of writing for boys, alongside our central analyses we pursue three additional lines of analysis.

First, we examined the writing motivation and engagement factors in relation to several socio-demographic characteristics (age, grade, language background, parent education and parent occupation) in order to determine the role that the characteristics play in writing motivation and engagement. Second, we examined the extent to which the MES writing factors are associated with several important writing and literacy outcomes (e.g. PB goals for writing, adaptability for writing), and whether these associations were similar across participant subgroups. This provided the opportunity to examine the conceptual nature of the writing motivation and engagement factors (are they associated with related outcomes as expected?) and may provide information relevant to intervention. Third, we harnessed several randomly drawn mixed-gender samples of students from archived data to determine how well the writing-specific MES factors parallel domain-general motivation and engagement factors.

Taken together, our analyses provided the opportunity to examine the writing-specific MES factors to see if they are conceptually and methodologically appropriate among a sample of boys. Our findings have the potential to be of relevance to intervention efforts given that by understanding students’ motivations for writing, educators and researchers may be in a better position to provide targeted support to students. Four research questions guided the study:

(1) To what extent are the MES factors conceptually and methodologically appropriate for assessing writing motivation and engagement among a sample of boys? (RQ1)

(2) To what extent do students’ socio-demographic characteristics (a) predict their writing motivation and engagement and (b) influence how students respond to the MES factors? (RQ2)
(3) To what extent are the MES factors (a) associated with several writing and literacy outcomes and (b) associated with the outcomes in similar ways across different participant subgroups? (RQ3)

(4) To what extent are the response processes of a sample of boys on the writing-specific MES factors similar to those of mixed-gender archive samples reporting on the domain-general MES factors? (RQ4)

With respect to these research questions and based on previous research (e.g. Green et al., 2007; Martin et al., 2013), we hypothesised that the MES factors would be appropriate for assessing writing motivation and engagement (RQ1), and that older students, students who speak English as an additional language, and students with lower SES would report less adaptive writing motivation and engagement (RQ2a). We also anticipated that there would be minor differences in how students responded to the MES factors across participant subgroups (e.g. Martin, 2009; RQ2b). Turning to potential links between the MES factors and the outcome variables, we anticipated that the adaptive MES factors would be positively associated with the outcomes – whereas the maladaptive factors would be negatively associated – given related research in the domain-general literature (e.g. Martin & Hau, 2010; RQ3a), and we expected minor differences in how the MES factors would be associated with the outcomes across different subgroups (RQ3b). Finally, we anticipated no differences in how our boys’ sample responded to the writing-specific MES factors compared with mixed-gender archive samples reporting on the domain-general MES factors (RQ4). This final hypothesis is based on prior research showing invariance across different groups with the MES factors (e.g. Green et al., 2007).

Methods

Participants and procedures

Study sample

Participants were 781 male high school students from one government school in the north-western suburbs of Sydney. This is a fairly typical middle-class school – the socio-economic status of students is one standard deviation above the average for Australian schools (ACARA, 2013a). Students had an average age of 14.6 (SD = 1.52; range 11–18) years and were in grade 7 (20%), grade 8 (12%), grade 9 (13%), grade 10 (31%), grade 11 (24%) or grade 12 (1%). The languages that students mostly spoke at home were English (60%), Cantonese (12%), Korean (7%), Mandarin (6%) or other languages (15%). Most participants’ parents had completed some form of post-secondary education – a certificate or diploma (19% for fathers; 31% for mothers), or a university degree (45% for fathers; 28% for mothers). Students were administered the survey by teachers during one 50-min class at school. The survey was administered in students’ English class; however, they were asked to focus on writing across the curriculum. All students in the class who received parental consent and gave assent participated while other students worked quietly on tasks set by the teacher. Class sizes for the most part ranged from 20 to 25 students and response rates were high (around 70%). The students were asked to request help from their teacher if needed and to complete the instrument by themselves.
Archive samples

Five mixed-gender random samples were drawn from a much larger archive sample of domain general motivation and engagement. These data have been collected over the previous decade and comprise over 30,000 Australian high school students. Archive sample details are reported in Martin (2009). Of note, the data collection procedures were identical to the study sample except that some of the archive students completed a paper form of the survey instead of an online form. The five random samples had the same sample size as the original sample (i.e. \( n = 781 \)). The five samples were between 41 and 44% female with a students’ average age ranging from 14 to 15 (SD range = 1.55–1.57) years.

Measures

All scales were contained within one survey. The socio-demographic questions appeared first followed by prior literacy achievement, motivation and engagement, and the writing-related outcomes. Table 1 shows the descriptive statistics for the different constructs involved in the study.

Socio-demographic characteristics

Students were asked to provide their age, grade, language background, parents’ education and parents’ occupation. Age was treated as a continuous variable and grade was treated as an ordinal variable. For language background, participants were identified as speaking mostly English (0) or another language (1) at home. For parent education, students were asked to report the level of education of their parents. This was scored on a scale ranging from ‘no education’ (coded as 0) to ‘university degree’ (coded as 6). For parent occupation, students were asked to report their parents’ type of job (or unemployment status). Parent occupation was scored on a scale ranging from ‘no paid job’ (coded as 0) to ‘professional’ (coded as 9).

Prior literacy achievement

Students were asked to report their literacy results on the previous NAPLAN test they completed (ACARA, 2011). It is important to note that this response encompasses both reading comprehension and writing – the two components of literacy assessed in the NAPLAN tests. Thus, we were not able to separate writing from reading. For reading comprehension, students are asked to read a variety of text types and answer questions about these (ACARA, 2011). For writing, students are asked to respond to a writing prompt as either a narrative or persuasive text type (ACARA, 2011).

In using this method to assess prior literacy achievement, we make the assumption that it closely reflects actual prior literacy achievement. Hattie’s (2009) work supports this assumption showing that students’ self-reports of prior achievement are associated very highly with their actual achievement (e.g. around \( r = .80 \)). Furthermore, previous work asking students to report their NAPLAN scores found moderately strong correlations between reported and actual literacy scores (e.g. \( r = .60 \); Collie, Martin, Malmberg, Hall, & Ginns, 2015).
Motivation and engagement for writing

In order to assess motivation and engagement for writing, we adapted the MES – High School (Martin, 2010) to refer specifically to writing. As per the original scale, 11 factors were assessed with four items each: self-efficacy (e.g. ‘If I try hard, I believe I can do my writing tasks well’), valuing (e.g. ‘Learning how to write is important’), mastery orientation (e.g. ‘I feel very pleased with myself when I do well in writing tasks by working hard’), persistence (e.g. ‘If I can’t understand my writing task at first, I keep going over it until I do’), planning (e.g. ‘I get it clear in my head what I’m going to do when I sit down to do a writing task’), task management (e.g. ‘When I have a writing assignment, I usually organise my writing/study

Table 1. Descriptive statistics for the writing motivation and engagement factors and outcome variables.

<table>
<thead>
<tr>
<th>Writing motivation and engagement</th>
<th>α</th>
<th>M</th>
<th>SD</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>CFA loading range (mean)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Statistic</td>
<td>Std. Error</td>
<td></td>
</tr>
<tr>
<td>Writing motivation and engagement</td>
<td></td>
<td></td>
<td></td>
<td>Statistic</td>
<td>Std. Error</td>
<td></td>
</tr>
<tr>
<td>Self-efficacy (for writing)</td>
<td>.83</td>
<td>5.55</td>
<td>1.07</td>
<td>−1.04</td>
<td>.09</td>
<td>1.62 .17 .70–.80 (.74)</td>
</tr>
<tr>
<td>Valuing (of writing)</td>
<td>.75</td>
<td>5.41</td>
<td>1.02</td>
<td>−1.12</td>
<td>.09</td>
<td>2.07 .17 .54–.73 (.67)</td>
</tr>
<tr>
<td>Mastery orientation (for writing)</td>
<td>.83</td>
<td>5.63</td>
<td>.99</td>
<td>−1.22</td>
<td>.09</td>
<td>2.67 .17 .66–.81 (.74)</td>
</tr>
<tr>
<td>Persistence (in writing)</td>
<td>.82</td>
<td>5.19</td>
<td>1.05</td>
<td>−.92</td>
<td>.09</td>
<td>1.70 .17 .59–.81 (.73)</td>
</tr>
<tr>
<td>Planning (for writing)</td>
<td>.86</td>
<td>4.82</td>
<td>1.23</td>
<td>−.58</td>
<td>.09</td>
<td>.22 .17 .64–.86 (.79)</td>
</tr>
<tr>
<td>(Writing) task management</td>
<td>.81</td>
<td>5.06</td>
<td>1.13</td>
<td>−.64</td>
<td>.09</td>
<td>.52 .17 .65–.83 (.73)</td>
</tr>
<tr>
<td>(Writing-related) anxiety</td>
<td>.81</td>
<td>3.97</td>
<td>1.37</td>
<td>−.10</td>
<td>.09</td>
<td>−.58 .17 .71–.74 (.72)</td>
</tr>
<tr>
<td>(Writing-related) failure avoidance (in writing)</td>
<td>.83</td>
<td>3.93</td>
<td>1.44</td>
<td>.05</td>
<td>.09</td>
<td>−.63 .17 .50–.89 (.72)</td>
</tr>
<tr>
<td>Uncertain control (in writing)</td>
<td>.81</td>
<td>3.75</td>
<td>1.37</td>
<td>−.05</td>
<td>.09</td>
<td>−.66 .17 .66–.78 (.74)</td>
</tr>
<tr>
<td>Self-handicapping (in writing)</td>
<td>.80</td>
<td>2.89</td>
<td>1.24</td>
<td>.38</td>
<td>.09</td>
<td>−.47 .17 .66–.80 (.71)</td>
</tr>
<tr>
<td>Disengagement (from writing)</td>
<td>.83</td>
<td>2.74</td>
<td>1.24</td>
<td>−.57</td>
<td>.09</td>
<td>−.16 .17 .62–.84 (.74)</td>
</tr>
<tr>
<td>Outcomes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal best goals (for writing)</td>
<td>.92</td>
<td>5.37</td>
<td>1.13</td>
<td>−.83</td>
<td>.09</td>
<td>1.28 .17 .84–.87 (.86)</td>
</tr>
<tr>
<td>Adaptability (for writing)</td>
<td>.82</td>
<td>4.93</td>
<td>1.17</td>
<td>−.54</td>
<td>.09</td>
<td>.48 .17 .67–.86 (.78)</td>
</tr>
<tr>
<td>Academic buoyancy (in writing)</td>
<td>.79</td>
<td>4.77</td>
<td>1.20</td>
<td>−.51</td>
<td>.09</td>
<td>.42 .17 .61–.80 (.69)</td>
</tr>
<tr>
<td>(Writing) enjoyment (Writing)</td>
<td>.92</td>
<td>4.17</td>
<td>1.54</td>
<td>−.28</td>
<td>.09</td>
<td>−.66 .17 .80–.92 (.86)</td>
</tr>
<tr>
<td>participation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prior literacy achievement</td>
<td>.92</td>
<td>4.66</td>
<td>1.30</td>
<td>−.53</td>
<td>.09</td>
<td>.03 .17 .77–.90 (.86)</td>
</tr>
</tbody>
</table>

Notes: For the outcome variables, loading ranges and means were taken from the CFA conducted with the writing motivation and engagement factors and the external variables.

Motivation and engagement for writing

In order to assess motivation and engagement for writing, we adapted the MES – High School (Martin, 2010) to refer specifically to writing. As per the original scale, 11 factors were assessed with four items each: self-efficacy (e.g. ‘If I try hard, I believe I can do my writing tasks well’), valuing (e.g. ‘Learning how to write is important’), mastery orientation (e.g. ‘I feel very pleased with myself when I do well in writing tasks by working hard’), persistence (e.g. ‘If I can’t understand my writing task at first, I keep going over it until I do’), planning (e.g. ‘I get it clear in my head what I’m going to do when I sit down to do a writing task’), task management (e.g. ‘When I have a writing assignment, I usually organise my writing/study
area to help me do it best’), anxiety (e.g. ‘When exams and assignments that involve writing are coming up, I worry a lot’), failure avoidance (e.g. ‘Often the main reason I work hard at writing is because I don’t want people to think that I’m dumb’), uncertain control (e.g. ‘When I get a good mark in a writing task I’m often not sure how I’m going to get that mark again’), self-handicapping (e.g. ‘I sometimes don’t try very hard on writing tasks so I have an excuse if I don’t do so well’) and disengagement (e.g. ‘Each week I’m trying less and less in my writing tasks’). Participants rated items from 1 (Strongly Disagree) to 7 (Strongly Agree). The original version of this scale has demonstrated sound psychometric properties in prior research (e.g. Martin, 2007, 2009; Martin, Yu, Papworth, Ginns, & Collie, 2014). The current study provides an opportunity to test the psychometric properties of a writing-specific version of the scale.

Writing-related outcomes

Adapted versions of previously published scales were used to assess the writing-related outcomes. Where the scales originally refer to school or schoolwork, this was changed to focus on writing: personal best goals for writing (adapted from the Personal Best Scale; Martin, 2006; Martin & Liem, 2010; e.g. ‘When I do writing tasks I try to do them better than I’ve done before’; 4 items), writing adaptability (adapted from Martin et al., 2013; e.g. ‘When faced with new or unfamiliar writing tasks, I am able to adjust my thinking or attitude to help me through’; 3 items), academic buoyancy (adapted from Martin & Marsh, 2008; e.g. ‘I don’t let writing stress get on top of me’; 4 items), enjoyment (adapted from Martin, 2007; e.g. ‘I enjoy writing’; 4 items) and participation (adapted from Martin, 2007; e.g. ‘I participate in classes that involve a lot of writing’; 4 items). Participants rated items from 1 (Strongly Disagree) to 7 (Strongly Agree). Numerous previous studies have provided evidence of validity and reliability for these scales in their more general forms (e.g. Martin et al., 2013). The current study provides an opportunity to test the writing-specific versions of these scales.

Statistical analyses

The aim of our statistical analyses was to examine the construct validity of the writing form of the MES (Martin, 2010). To do this, we conducted examinations of internal and external validity using confirmatory factor analysis (CFA) and structural equation modelling (SEM). Our analyses were performed with Mplus version 7.2 (Muthén & Muthén, 2013) using maximum likelihood as the method of estimation. Missing data were handled using Full Information Maximum Likelihood defaults in Mplus. Model fit was assessed using the root mean square error of approximation (RMSEA) and the comparative fit index (CFI). RMSEA values of .05 or less and .08 or less were considered evidence of good and adequate fit, respectively (Schumacker & Lomax, 2010). CFI values of .95 or more and .90 or more were considered evidence of good and adequate fit respectively (McDonald & Marsh, 1990).

Examining internal validity

For internal validity, we examined descriptive statistics and reliability coefficients of the MES factors, and we conducted a CFA to obtain factor loadings and correlations
between the factors (RQ1). Combined, these analyses provided understanding of the reliability, normality, factor structure and relationships among the MES factors.

Examining external validity

Socio-demographic characteristics. For our first test of external validity, we conducted multiple-indicator-multiple-cause (MIMIC) modelling with SEM to examine the extent to which different socio-demographic characteristics predicted the MES factors (RQ2a). We examined five socio-demographic characteristics: age, grade, language background, parent education and parent occupation.

Our second examination of external validity involving the socio-demographic characteristics was invariance testing with multigroup CFAs to determine the extent to which the psychometric properties of the instrument differ as a function of three student characteristics: age (<15 years coded 0, ≥15 years coded 1), grade (≤grade 9 coded 0, >grade 9 coded 1) and language background (English-speaking background coded 0, non-English-speaking background coded 1; RQ2b). To test for invariance, we ran progressively more restrictive models. We began by testing configural invariance which allows all parameters to load freely across groups. Next, we tested metric (loadings fixed across groups) and then scalar invariance (loadings and intercepts fixed). The minimum criterion for invariance is considered to be scalar because it allows for latent means and correlations across group to be interpreted in a straightforward manner (van de Schoot, Lugtig, & Hox, 2012). We also tested several further models: residual (loadings, intercepts and residuals fixed), structural (loading, intercepts and correlations fixed) and stronger structural (loading, intercepts, residuals and correlations fixed) invariance.

Writing and literacy outcomes. Next, we examined the six writing and literacy outcomes: PB goals, adaptability, academic buoyancy, enjoyment, participation and prior literacy achievement. We first conducted a CFA to obtain correlations between the MES factors and the outcomes (RQ3a). This provided an idea of the extent to which the different factors of writing motivation are associated with other constructs as expected. Next, we conducted invariance tests using multigroup CFAs to ascertain the extent to which the correlations between the MES factors and the outcomes were comparable across three different socio-demographic characteristics (age, grade, language background; RQ3b). To test invariance, we ran two models. The first involved fixing all parameters (i.e. intercepts, loadings and residuals) except the correlations among the MES factors and the outcomes. The second involved fixing all parameters to see if there was a reduction in fit with this more restrictive model.

Archive samples. Finally, we compared our sample’s responses on the writing MES factors with responses on the domain-general MES-High School using five randomly drawn samples from a larger archive data-set (RQ4). We conducted invariance tests to ascertain the extent to which the psychometric properties of the writing factors were comparable with the domain-general factors. This also offered the opportunity to provide some support for the representativeness of our findings beyond male samples. We tested for configural, metric, scalar, residual, structural and stronger structural invariance.
Results

Examining internal validity

Table 1 provides the reliability coefficients, descriptive statistics, range and mean of factor loadings for each construct. The reliability coefficients, skewness and kurtosis values and CFA loadings are all at acceptable levels suggesting internal consistency of the items, approximate normality of the MES factors, and that the items loaded well under each factor (RQ1). The fit for the CFA model was adequate: $\chi^2(847) = 2270.03$, $p < .001$, RMSEA = .046, CFI = .92. Correlations among the factors are shown in Table 2. These appear as expected with strong positive correlations occurring among the adaptive factors as well as among the maladaptive factors, but less so across the adaptive and maladaptive factors. Taken together, these results provide sound measurement support for the MES factors.

Examining external validity

Socio-demographic characteristics

Table 3 shows the beta coefficients from the MIMIC model, which demonstrated adequate fit to the data: $\chi^2(1012) = 2594.607$, $p < .001$, RMSEA = .045, CFI = .92 (RQ2a). Significant effects largely involved language background and parent education. Students who spoke a language other than English at home tended to report greater valuing of writing, task management, anxiety, failure avoidance and self-handicapping than students who spoke only English. In addition, greater parent education was associated positively with self-efficacy, valuing, mastery orientation, persistence, planning and task management, and negatively with self-handicapping and disengagement. Other significant effects showed that older students were more

Table 2. Latent variable correlations among the motivation and engagement for writing factors.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Self-efficacy (for writing)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Valuing (of writing)</td>
<td>.83</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Mastery orientation (for writing)</td>
<td>.82</td>
<td>.87</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Persistence (in writing)</td>
<td>.84</td>
<td>.76</td>
<td>.72</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Planning (for writing)</td>
<td>.70</td>
<td>.63</td>
<td>.59</td>
<td>.77</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. (Writing) task management</td>
<td>.74</td>
<td>.76</td>
<td>.76</td>
<td>.79</td>
<td>.76</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. (Writing-related) anxiety</td>
<td>-.17</td>
<td>.01</td>
<td>.02</td>
<td>-.19</td>
<td>-.12</td>
<td>.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. (Writing-related) avoidance</td>
<td>.01</td>
<td>.11</td>
<td>.12</td>
<td>-.04</td>
<td>.04</td>
<td>.14</td>
<td>.58</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Uncertain control (in writing)</td>
<td>-.29</td>
<td>-.11</td>
<td>-.09</td>
<td>-.33</td>
<td>-.25</td>
<td>-.13</td>
<td>.72</td>
<td>.44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Self-handicapping (in writing)</td>
<td>-.37</td>
<td>-.31</td>
<td>-.33</td>
<td>-.50</td>
<td>-.39</td>
<td>-.36</td>
<td>.40</td>
<td>.35</td>
<td>.55</td>
<td></td>
</tr>
<tr>
<td>11. Disengagement (from writing)</td>
<td>-.61</td>
<td>-.59</td>
<td>-.51</td>
<td>-.59</td>
<td>-.48</td>
<td>-.45</td>
<td>.44</td>
<td>.24</td>
<td>.50</td>
<td>.75</td>
</tr>
</tbody>
</table>

Notes: Correlations with an absolute value of: (a) $r > .08$, significant at $p < .05$; (b) $r > .11$, significant at $p < .01$; and (c) $r > .14$, significant at $p < .001$. 
likely to report self-handicapping and disengagement in writing, students in higher grades were more likely to report lower valuing of writing, and students whose parents worked in higher rated occupations (e.g. professional or management positions) were less likely to report writing-related anxiety.

Table 4 shows the results of the invariance tests using multi-group CFAs (RQ2b). Measurement invariance was found across subgroups for the three socio-demographic characteristics (age, grade and language background). More precisely, changes in RMSEA and CFI were within the specified cutoffs (i.e. ΔRMSEA ≤ .015; Chen, 2007; ΔCFI ≤ .01; Cheung & Rensvold, 2002) from configural (all parameters free) to stronger structural (loadings, intercepts, correlations and residuals fixed). This provides confidence that among our sample the psychometric properties of the instrument were largely comparable across subgroups by age, grade and language background. Moreover, it suggests that students’ responses were based on their experiences of the MES factors rather than personal characteristics.

Writing and literacy outcomes

The CFA involving the MES factors and the outcomes yielded adequate fit to the data: $\chi^2(1864) = 4251.33$, $p < .001$, RMSEA = .041, CFI = .92. Table 5 provides the latent correlations. The adaptive motivation and engagement factors were positively associated and the maladaptive factors were negatively associated with the writing and literacy outcomes (RQ3a). This provides evidence of construct validity. The multi-group CFAs involving the MES factors and outcomes demonstrated that invariance was met for the three socio-demographic characteristics (RQ3b). More precisely, there was minimal change in fit (i.e. ΔRMSEA ≤ .015, Chen, 2007;
Table 4. Invariance tests across age, grade, language background.

<table>
<thead>
<tr>
<th></th>
<th>RMSEA/CFI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Configural (all parameters free)</td>
</tr>
<tr>
<td>Age</td>
<td>.051/.91</td>
</tr>
<tr>
<td>Grade</td>
<td>.051/.90</td>
</tr>
<tr>
<td>Language background</td>
<td>.054/.90</td>
</tr>
</tbody>
</table>

Notes: Although several of the CFI values for language background are below the cut-off for adequate fit, they do meet the criteria for measurement invariance in terms of no substantial decline in fit from one invariance test to another.
Table 5. Latent correlations between the MES writing factors and the outcome variables.

<table>
<thead>
<tr>
<th>Writing-related outcomes</th>
<th>PB goals for writing</th>
<th>Writing adaptability</th>
<th>Buoyancy for writing</th>
<th>Enjoyment of writing</th>
<th>Participation in writing</th>
<th>Mean correlation of writing-related outcomes</th>
<th>Prior literacy achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-efficacy</td>
<td>.77</td>
<td>.73</td>
<td>.65</td>
<td>.54</td>
<td>.61</td>
<td>.66</td>
<td>.24</td>
</tr>
<tr>
<td>Valuing</td>
<td>.81</td>
<td>.70</td>
<td>.56</td>
<td>.62</td>
<td>.61</td>
<td>.66</td>
<td>.06</td>
</tr>
<tr>
<td>Mastery orientation</td>
<td>.75</td>
<td>.62</td>
<td>.51</td>
<td>.54</td>
<td>.53</td>
<td>.59</td>
<td>.16</td>
</tr>
<tr>
<td>Persistence</td>
<td>.83</td>
<td>.83</td>
<td>.69</td>
<td>.51</td>
<td>.69</td>
<td>.71</td>
<td>.29</td>
</tr>
<tr>
<td>Planning</td>
<td>.70</td>
<td>.71</td>
<td>.57</td>
<td>.50</td>
<td>.60</td>
<td>.62</td>
<td>.20</td>
</tr>
<tr>
<td>Task management</td>
<td>.79</td>
<td>.70</td>
<td>.51</td>
<td>.46</td>
<td>.57</td>
<td>.61</td>
<td>.11</td>
</tr>
<tr>
<td>Anxiety</td>
<td>−.10</td>
<td>−.34</td>
<td>−.52</td>
<td>−.39</td>
<td>−.30</td>
<td>−.33</td>
<td>−.31</td>
</tr>
<tr>
<td>Failure avoidance</td>
<td>.04</td>
<td>−.16</td>
<td>−.22</td>
<td>−.06</td>
<td>−.08</td>
<td>−.10</td>
<td>−.20</td>
</tr>
<tr>
<td>Uncertain control</td>
<td>−.23</td>
<td>−.41</td>
<td>−.46</td>
<td>−.34</td>
<td>−.35</td>
<td>−.36</td>
<td>−.32</td>
</tr>
<tr>
<td>Self-handicapping</td>
<td>−.46</td>
<td>−.44</td>
<td>−.37</td>
<td>−.26</td>
<td>−.42</td>
<td>−.39</td>
<td>−.32</td>
</tr>
<tr>
<td>Disengagement</td>
<td>−.58</td>
<td>−.57</td>
<td>−.45</td>
<td>−.54</td>
<td>−.59</td>
<td>−.55</td>
<td>−.29</td>
</tr>
</tbody>
</table>

Notes: Correlations with an absolute value of: (a) \( r \geq .08 \) are significant at \( p < .05 \); (b) \( r \geq .10 \) are significant at \( p < .01 \); and (c) \( r \geq .12 \) are significant at \( p < .001 \).
ΔCFI ≤ .01; Cheung & Rensvold, 2002) between the model where all parameters were fixed except the correlations among the MES factors and outcomes, and the model where all parameters were fixed (including the correlations). This indicates that there were similar relationships between the MES factors and the outcomes across the different subgroups.

Archive samples

Invariance tests were run comparing our sample with each of the five random samples (RQ4). These demonstrated that configural (average RMSEA = .051 and average CFI = .89 across the five random samples), metric (average RMSEA = .050, average CFI = .90), scalar (average RMSEA = .050, average CFI = .90), residual (average RMSEA = .052, average CFI = .89) and structural (average RMSEA = .049, average CFI = .90) invariance were met due to minimal changes in RMSEA and CFI (Chen, 2007; Cheung & Rensvold, 2002). Stronger structural invariance (constraining loadings, intercepts, residuals and correlations; average RMSEA = .052, average CFI = .88), however, was not supported. Nonetheless, the minimal requirement of scalar invariance was achieved, along with several stricter types of invariance. This indicates that the response processes of our boys sample on the writing MES factors were similar to a mixed-gender sample reporting on the domain-general MES.

Discussion

The multidimensional model for writing motivation and engagement

The findings suggest that the multidimensional model appears to work well to assess writing motivation and engagement. The fact that the adaptive MES factors were positively correlated with one another and that the same was true for the maladaptive factors provides preliminary evidence that they are functioning as expected. Added to this, it was important to see that adaptive and maladaptive factors were generally negatively associated with one another. One unexpected finding was that students motivated to write by a desire to avoid poor performance or disappointing others (failure avoidance) tended to value writing more, be more mastery oriented to writing, and plan their writing tasks effectively. A possible explanation for this is that students may be more afraid of failure when they are highly invested in their writing performance (through high levels of valuing, mastery and task management). In addition, given the large proportion of students who spoke Asian languages at home in the sample, there may be cultural factors coming into play here. For example, although domain-general research has shown that failure avoidance is negatively associated with the adaptive motivational factors among Australian students, the associations among these constructs for students from Asian cultures is less clear (e.g. Martin et al., 2014). It is important to note that this may also be a finding that is particular to our sample of boys. Thus, future research that examines writing motivation and engagement among girls, along with research examining motivation and engagement in other domains such as mathematics where boys perform as well as (or better) than girls (ACARA, 2013b) will help to better illuminate this finding. Despite this unexpected result, the findings overwhelmingly indicate the appropriateness of the MES as an integrative multidimensional view of writing motivation and engagement.
With respect to implications for improving boys’ writing motivation and engagement, the support provided for the MES factors indicate that teachers may want to utilise efforts that are multidimensional in nature given that writing motivation and engagement appear to be multifaceted. Previous research provides recommendations for how this may be addressed. For example, strategies that are particularly relevant for motivating boys include providing them with clear objectives, a variety of text types and questions that promote understanding (Munns et al., 2006). Other researchers recommend that teachers assign students fewer papers and more opportunities for revision to help minimise maladaptive beliefs about writing (Sanders-Reio et al., 2014). Providing task-based feedback on students’ writing and demonstrating that mistakes reveal information that can guide future writing efforts (Curwood, 2012; Martin, 2007) may also be helpful – particularly for boys who fear failure. Finally, the use of online spaces and digital tools (e.g. social media and fan fiction) for writing tasks may be another strategy to help increase boys’ interest in writing given that these provide students a chance to engage in topics they are interested in and share their writing with a global audience (Curwood, Magnifico, & Lammers, 2013). This type of real-world authenticity may help boys to value writing more and engage in it more frequently (Munns et al., 2006). An important avenue of future research is to examine the extent to which efforts to promote writing motivation and engagement translate to improved writing performance. Research involving the factors at a domain-general level suggests that this is possible (Martin, 2008).

Writing motivation and engagement across subgroups

Our analyses involving the socio-demographic characteristics revealed that there were several mean-level differences in writing motivation and engagement across respondent subgroups. In general, parent education was associated with the factors in beneficial ways, whereas language background had mixed associations. The positive association with parent education possibly occurred because these parents may be more familiar with and supportive of academic values and cultures that are promotive of academic achievement (Gniewosz & Eccles, 2013). For language background, the results suggested higher valuing and task management, but also higher anxiety, failure avoidance and self-handicapping for students with a non-English-speaking background. This confluence of factors may result from high levels of achievement striving standards that exist among some cultures (e.g. Martin & Hau, 2010), where pressure to succeed can result in high valuing, but also some maladaptive processes. The extent to which this differs for students from various ethnic backgrounds and according to English proficiency is an important question for future research to better understand these students’ experiences. Another interesting finding was that students in older grades tended to report lower valuing of writing. This is concerning given that the disparity in boys and girls writing performance appears to widen at the higher grades (e.g. ACARA, 2013b).

Relations with the outcomes

The correlations that the MES factors had with the writing and literacy outcomes were all as expected. The adaptive factors were strongly and positively associated with the writing-related outcomes and, in most cases, also with literacy achievement. Likewise, the maladaptive factors were almost all negatively associated with all the
outcomes, albeit a little less strongly. These findings are not surprising and indicate that students who are adaptively motivated and engaged in writing tend to report positive writing-related and literacy outcomes. One exception was the relationship between valuing of writing and prior literacy achievement, which was a non-significant relationship. This is different from research in other domains, which has shown that valuing of mathematics is an important correlate of mathematics achievement (e.g. Plenty & Heubeck, 2011). Once again, there is a need for research to examine whether this finding is specific to boys and/or the domain of writing. At the same, this finding may have occurred because our literacy achievement outcome included both reading and writing. Thus, more research is needed to tease apart the direct link between valuing of writing and writing achievement among both boys and girls to better understand this association.

Taken together, the correlations between the MES factors and outcomes provide evidence that the writing motivation and engagement factors operated as expected. Moreover, they highlight links to outcomes that have been shown to be implicated in positive student development – both academic and well-being related – in the domain-general literature (e.g. Martin & Liem, 2010; Van Ryzin, Gravely, & Roseth, 2009). Given the positive correlations between the adaptive MES factors and the outcomes, there may be merit in intervention efforts related to the outcomes. For example, PB goals can be promoted by having students focus on their effort or performance in a previous task and setting a goal to better that in another task (Martin & Elliot, 2015). With respect to writing, this may involve asking students to focus on increasing how much or how accurately they were able to write in a previous task. The extent to which such efforts are associated with improvements in writing for boys and girls is one fruitful avenue for future research.

**Understanding from the archive samples**

The findings demonstrated measurement invariance across our sample and the mixed-gender archive samples, which suggests that the response processes used to answer the domain-specific and domain-general instruments are similar across groups and that there were no discernible differences based on the gender make-up of the samples. This is valuable information given that our sample only included male students. More precisely, it indicates that the way students answered the questions as a whole (not necessarily their individual responses though) were similar across the different samples, which suggests that students approached the instruments in similar ways. Moreover, it draws links between the writing version of the instrument and the original instrument from which it was developed (and for which there are several studies providing evidence of validity; e.g. Martin, 2007). This offers some confidence that the writing motivation and engagement factors were functioning appropriately. Moving forward, there is a need for research that looks at writing motivation and engagement among more diverse samples, including from different schools with both male and female students.

**Limitations, future directions and conclusion**

This study has several limitations. The first is that our data were self-reported. Although this is not an inappropriate method when attempting to measure students’ intrapsychic experiences, there is a need for further research using other
measures – particularly in the case of achievement. There is also a need to collect data about students’ actual writing performance to understand whether the MES factors are associated with this more strongly than other domains such as reading achievement.

A second limitation is that our sample comprised only male students. As noted above there is a need for research that examines writing motivation and engagement among mixed-gender samples. Notwithstanding this, we were interested in building the literature in relation to boys’ experiences of writing – and a male-only sample allowed us to do that. Moreover, the comparisons with mixed-gender archive samples provided partial support for the representativeness of our findings.

A third limitation is that students in our sample were all from one school. Thus, it is possible that participants’ experiences of writing motivation and engagement were unique to that schooling context. However, as noted in methods, this school is reflective of a typical profile of Australian government schools, particularly with regard to the number of students from non-English-speaking backgrounds in an urban context. In addition, the comparisons with archive samples randomly drawn from a much larger data-set involving students from all types of schools across Australia provide some support for the generality of our findings. Notwithstanding this, future research with samples from different schools is important for generalisation of the results.

To conclude, we provided support for the use of the MES as a means for assessing multidimensional writing motivation and engagement. Given that motivation and engagement are constructs that are beneficial in and of themselves – and also associated with important outcomes – the findings of the current study are relevant to researchers and educators seeking to better assess and understand essential skills such as writing that are relevant to students’ optimal functioning across the curriculum.

Disclosure statement
No potential conflict of interest was reported by the authors.

References


