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Exploring the writing attainment gap: profiling writing challenges and predictors for children with English as an additional language

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Abstract
While there is some evidence of a gap in English writing achievement between children with English as an additional language (EAL) compared to their monolingual English-speaking (EL1) peers, the source of this gap remains unclear. This study examines whether writing presents a specific challenge for children with EAL beyond their oral language and reading skills, and whether the factors affecting writing skills differ between EAL and EL1 groups. In a longitudinal design, 100 children aged 9 to 10 years completed a fiction writing task and single-word spelling task twice over a school year. They also completed a non-fiction writing task, and measures of nonverbal intelligence, receptive vocabulary, expressive and receptive oral language, decoding, and reading comprehension. Children with EAL demonstrated lower general writing performance than monolinguals, commensurate with their other language and reading skills, but a relative strength in single-word spelling. Predictors were similar for children with EAL and monolinguals, with decoding skill predicting spelling and writing, and expressive oral language predicting writing. Effects of genre and specific writing sub-skills are also discussed, as well as implications for closing the writing attainment gap.

Keywords Writing · Spelling · Child literacy · EAL · ESL · ELL

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Introduction

Writing is a critical life skill (Graham, 2019). Learning to write requires the mastery of the processes of transcription and composition (Berninger et al., 2002), including their different component sub-skills (e.g., spelling, vocabulary use), and the ability to produce different genres of text (Danzak, 2011). Whilst many children struggle with writing, children learning English as an additional language (EAL) seem to be particularly vulnerable to poorer writing outcomes in English (Hessel & Strand, 2021; National Center for Education Statistics, 2012). Identifying predictors of these student's writing skills is also critical to find targets for intervention (Murphy & Unthiah, 2015; Oxley & de Cat, 2019). A growing body of research is emerging which examines writing skills of EAL students (e.g., Camping et al., 2020; Danzak, 2020; Harrison et al., 2016; Herbert et al., 2020) and predictors of their performance (e.g., K. M. Graham & Eslami, 2020; Harrison et al., 2016). However, few studies have taken a multivariate approach, by measuring many facets of writing or controlling for other language skills. Furthermore, even fewer have adopted a longitudinal approach, examining skills over time. The present research examines the profile of strengths and weaknesses in English writing skills of British EAL students compared to their monolingual peers and relative to their other language capacities over the course of one school year.

Learning to write

Learning to write is crucial to enhance students' understanding of what they learn in class (Graham & Hebert, 2011), to complete examinations successfully (Connelly et al., 2005), and to communicate and express themselves in and outside of the classroom (Department for Education, 2012). Children who have positive attitudes to writing have greater emotional wellbeing (National Literacy Trust, 2018), and literacy skill in adulthood is associated with not only employability but also life expectancy (Gilbert et al., 2018). However, large numbers of students fail to meet basic educational levels in writing (National Center for Education Statistics, 2012), and students tend to underperform in writing relative to reading (Department for Education, 2012). Despite the significance of writing, it has received relatively limited research attention compared to reading (Murphy, 2018).

The process of learning to write requires the development of several sub-skills, and one way to divide these is into transcription and composition processes. The simple view of writing (Berninger et al., 2002) describes how writers must co-ordinate the mechanical, or micro-level, aspects of writing (here referred to as transcription) with the ideational, or macro-level aspects (here referred to as composition). Transcription can be defined as the process of executing writing by committing our ideas into orthographic marks representing letters, words, sentences and paragraphs. In more developed learners, transcription requires developing fluency and accuracy in handwriting, spelling conventions, punctuation and capitalisation. Composition comprises the generation of ideas for writing content, including vocabulary, structure and grammar, organisation, and development of ideas. Transcription and composition

are not completely independent, and indeed co-ordination of both of these processes simultaneously can be a challenge for budding writers: behavioural and neuroscientific data converge to suggest that for primary-school age children, handwriting draws on limited executive resources, such as working memory (Palmis et al., 2020) which may detract from their ability to compose text. Thus, writing is a complex skill that involves learning a range of sub-skills and co-ordinating these within a writing task.

As such, assessments of children's writing vary in which sub-skills they tap into. For example, the Writing Ability Measure (WAM) (Dunsmuir et al., 2015) is a timed, open-ended writing task in which children generate their own text in response to a prompt. This assessment thus measures children's writing skills in the context of an ecologically relevant task where they must co-ordinate all aspects of writing. The text is scored across 7 subscales, which reflect transcription (handwriting, spelling, punctuation, grammar) and composition (vocabulary, organisation, and development of ideas). Subscales can be combined to create a composite total writing score or examined individually to benchmark children's ability in each writing sub-skill. Other assessments are more focused on one element of writing, for example the spelling scale in the Wechsler Individual Achievement Test (Wechsler, 2005). This standardised test asks children to spell a series of words that are read aloud, and so focuses only on transcription, specifically spelling skill, in a decontextualised way. Thus, a range of assessments can be used to tap into writing skills more broadly, or sub-skills of transcription and composition more narrowly, and within more ecologically valid or more controlled contexts.

Learning to write also involves developing an understanding and application of genre (Danzak, 2011; Riches & Genesee, 2006). Genre describes the type of a text and can be divided into two broad categories of fiction (i.e., describing imaginary events) and non-fiction (i.e., describing real events). School curricula typically involve engagement with reading and writing both of these forms, for example the National Curriculum for English in England and Wales requires pupils from Year 2 (age 6 to 7 years) onwards to write narratives, poetry and write about real events for different purposes (Department for Education, 2013).

Children learning multiple languages, such as those learning English as an additional language (EAL), may be vulnerable to slower development in terms of English writing skills than monolingual speakers. Children with EAL are those who are educated in an English context but who are exposed to a language at home that is not English, and make up 21.3% of primary school pupils in England and Wales (Department for Education, 2020) and 10.1% of elementary and secondary students in the USA (U.S. Department of Education National Center for Education Statistics, 2020). Children with EAL tend to show lower attainment in writing compared to their native English speaking peers (Department for Education, 2012; Hessel & Strand, 2021), although data from EAL pupils in the UK suggests that this gap is relatively small (between 2 and 4%) and is lower than the gap for reading. By contrast, in the USA the gap is 60% (National Center for Education Statistics, 2012). Regardless of the precise size of the gap, an attainment gap in writing could be explained by difficulties with other language and literacy skills (such as oral language skills, receptive vocabulary, or reading skills) which are known to be a challenge for EAL students (Booton et al., 2021; Dixon et al., 2020; Hessel & Murphy, 2019; Paradis & Jia, 2017). Indeed there

is some evidence that school attainment gaps for EAL students disappear or even reverse for those with higher levels of English proficiency (Hessel & Strand, 2021). However, they could also reflect additional and specific challenges with writing itself. Whilst there is some existing literature addressing the skills of children with EAL in transcription and composition (reviewed below), relatively little research examines writing as a specific challenge above and beyond other language and literacy skills. Also reviewed below are studies examining the factors that predict writing skills amongst pupils with EAL.

Comparing EAL and monolingual children's writing skills

Existing data comparing children's transcription skills between EAL and monolingual students suggest that EAL students are not at a disadvantage in this area. One study found no difference in fluency in a handwriting task between a group of 8 to 9-year-old EAL students and native English speakers in Canada (Harrison et al., 2016). For spelling skills, a number of studies have found no difference between EAL and native English speakers (EL1) or monolinguals in measures of single-word spelling accuracy (Harrison et al., 2016; Herbert et al., 2020; Wang & Geva, 2003) as well as measures of spelling error rates within a wider text-writing exercise (Harrison et al., 2016; Herbert et al., 2020). One further study suggested that punctuation and capitalisation errors in a story writing exercise were equivalent in 9 to 11-year-old EAL and monolingual students (Herbert et al., 2020). These cross-sectional studies imply that children with EAL do not differ from their peers in transcription skills in English. However, these studies did not control for potential confounding factors (e.g., age, nonverbal ability), or explore whether this made transcription a relative strength for EAL students compared to their other language skills (e.g., oral language).

In relation to composition skills, comparisons of EAL and EL1 students have been more mixed. Three studies found no evidence for a difference between EAL and EL1 students in terms of lexical diversity, sentence complexity, or overall text quality in an expository essay writing task (Danzak, 2020); story coherence and overall quality (Herbert et al., 2020); or a composite of organisation and vocabulary diversity in a paragraph writing task about an ideal holiday (Harrison et al., 2016). However, these studies which generated null results again did not control for any other potential differences between groups (e.g., in age or non-verbal intelligence), which could have masked the effects. Indeed, two other studies have suggested that EAL children face challenges with composition compared to their monolingual peers. These differences were found in respect of a composite score of organisation and elaboration in an informative essay for 11 to 13-year-olds (Camping et al., 2020); and a composite score of organisation, vocabulary, and holistic quality on a task involving writing a paragraph about their preferences for 9 to 10-year-olds (Babayiğit, 2014). These studies controlled for some potential confounds, specifically socio-economic status in the latter, and race, gender and grade in the former, increasing the confidence that differences found are due to EAL status. These studies did not examine whether EAL children's poorer composition skills are commensurate with their other language skills; in other words, whether the effect of language group disappears or is

reversed when controlling for their vocabulary or reading skill. Because these studies use composite measures, it is also impossible to determine relative strengths and weaknesses in sub-skills of composition.

A further in-depth study was conducted to compare specific areas of strength and weakness in writing, including transcription and composition, but in this case for EAL children who are within the same level of attainment as their monolingual peers (Cameron & Besser, 2004). This study of British EAL children assessed transcripts from a narrative writing task from a formal examination. They demonstrated that EAL and monolingual children whose scripts were awarded the same overall grade (level 3, 4 or 5) nonetheless differed in terms of some specific subskills. In several areas, EAL children performed worse than monolinguals, specifically in terms of accurate use of formulaic phrases, grammar (clause length, correct use of articles and prepositions), story development and endings. On the other hand, in other areas, students were found to be equivalent, including fluency (i.e., text length), punctuation, vocabulary richness, paragraph organisation, and other elements of grammar (e.g., pronouns), and children with EAL at level 4 performed *better* than monolingual children in terms of including more metaphors and similes, and spelling. Overall, the pattern is complex, but it seems to be that composition skills are generally more challenging for EAL pupils, except for some specific aspects of grammar, whereas transcription skills (like spelling and punctuation) are not. This suggests that for EAL children at the same level of achievement, these may be specific difficulties that they have in narrative writing.

It is notable that only one of these existing studies had a longitudinal design (Herbert et al., 2020). This work demonstrated that over two school years, both EAL and EL1 students improved their single-word spelling and narrative transcription and composition skills and reported that this improvement was similar between the groups. This implies that we might expect any gap between EAL and EL1 learners to be maintained, rather than reduced or increased, over time. However, this study did not statistically test for an interaction between time and language group, and so more studies utilising a longitudinal design are important to verify this.

Predictors of EAL children's writing skills

As well as determining whether there are differences between language groups, identifying predictors of EAL children's writing skill is critical to inform future interventions. Some studies have identified word reading as a predictor of transcription. One found that English reading skill predicted English spelling skill longitudinally over a year, controlling for L1 spelling and reading skill (O'Brien et al., 2020), whilst another demonstrated that English word decoding but not receptive vocabulary predicted children's English spelling skills, after controlling for L1 spelling and reading (Li et al., 2012). Outside of reading, rapid letter naming and phonological awareness were found to predict spelling, both single-word and in-text, for 8 to 9-year-old EAL children, but verbal working memory and syntactic awareness did not (Harrison et al., 2016) and this pattern was the same for monolingual children. Therefore, reading has been identified as of particular importance for children's spelling skills, along

with phonological awareness, whilst other oral language skills (receptive vocabulary and syntactic awareness) have not shown an effect. However, few studies (Harrison et al., 2016) have included monolingual comparison groups, and studies have rarely included measures of reading and oral language together to assess their relative impact for these two groups.

In terms of factors contributing to EAL children's composition, existing research indicates that several English language skills are likely important. A meta-analysis conducted across settings (EAL and English as a Foreign Language [EFL]) and educational levels (from preschool to adult education) showed significant correlations of oral language, vocabulary, and transcription skills with composition (Graham & Eslami, 2020). However, the effects of oral language and vocabulary were less strong for EAL than EFL students. Indeed, one of the studies included in this meta-analysis (Harrison et al., 2016) found no effect of receptive vocabulary on EAL students' total composition performance (including fluency, organisation and vocabulary) when writing a paragraph about their favourite vacation, although it did find an effect of this measure for EL1 students. A further study which was not included in the meta-analysis found an impact of rapid letter naming, but not phonological awareness, on aspects of composition (fluency, lexical diversity and writing quality), after controlling for age and years of using English (Grewal & Williams, 2018). Thus, it seems that transcription skills consistently impact composition, and that vocabulary, oral language, and rapid letter decoding, may also predict composition skills for EAL students. As with studies on predictors of transcription, few include a monolingual comparison group, or include many different predictors in the same analysis.

The role of genre

The genre of the writing task is also an important factor to consider in relation to EAL children's writing performance. Some have argued that bilingual children may experience particular difficulty in understanding and writing nonfiction academic texts such as expository or persuasive texts (Riches & Genesee, 2006). Indeed, as part of Cameron and Besser's study (2004) discussed earlier, a smaller sample of children's writing of a radio advertisement for a toy were analysed in terms of format, information, and style. EAL children were less likely to use key features of the genre (such as a hook) to create persuasive effect than monolingual children whose writing was graded at the same level. Other studies found that L2 proficiency did not affect children's ability at persuasive composition (Bermudez & Prater, 1994), and Spanish-speaking EAL students performed similarly in terms of composition (lexical sophistication) in expository and narrative tasks in English (Danzak, 2011), but this does not show whether L1 and L2 speakers differ overall. Thus, there is reason to expect that EAL and monolingual children may differ in their non-fiction as well as their fiction writing, although whether students with EAL perform significantly worse in non-fiction than fiction texts relative to their monolingual peers is yet to be empirically tested.

The present study

The current study aims to address several gaps in the existing literature on EAL children's English writing skills. Existing studies of EAL students' writing skill tend to focus on only EAL students (without a monolingual comparison); on a single timepoint (cross-sectional); on a single genre of writing task (e.g., narrative writing); on a limited number of subskills of writing (e.g., spelling only, or a composite measure); and/or on a limited number of predictors of writing (e.g., phonological skills). This limited focus means that evaluating the relative contribution of these different factors to writing performance is impossible. Furthermore, previous studies tended not to control for potential confounds (such as differences in non-verbal ability between samples) which could mask or explain differences between groups, or to verify whether writing skills are a relative area of strength or weakness compared to EAL students' other language skills.

To address these gaps in the literature, we conducted a longitudinal study with a sample of EAL and monolingual children in the UK. Writing was operationalised both in terms of elements of transcription and composition on a holistic writing task (the WAM), and spelling in a controlled testing context (WIAT-II). Children's oral language and reading skills were assessed, and age, gender, and non-verbal intelligence controlled in analyses. Linear mixed effects models allowed a range of both child-level and assessment-level factors to be considered simultaneously.

The primary purpose of the study was to identify whether children with EAL differ in their writing skills relative to monolingual English-speaking children, and any longitudinal change in this difference. The second aim was to identify the relative contribution of predictors of EAL children's writing skill, including genre, subskill, and language skills. The third aim was to ascertain whether these predictors seem to differ from those of monolingual children.

Method

Design

The study had a mixed (between and within-subjects') longitudinal design. Data collection took place at two time-points: Time 1 (Autumn 2011) and Time 2 (Spring/Summer 2012). The primary between-subjects factor was language status (EAL vs. monolingual). Independent variables were receptive vocabulary, expressive vocabulary, and reading skills in English, as well as non-verbal intelligence. The dependent variables consisted of scores on the WIAT spelling task (Time 1 and Time 2), and scores on the Writing Ability Measure (WAM) for a narrative writing task (at Time 1 and Time 2) and an expository writing task (at Time 2 only).[1]

[1] The expository task was only administered at time 2 to reduce the burden on participants and because the comparison between genres could be completed with one time point only.

Participants

Participants were 100 Year 5 students (aged 9 to 10 years) from five primary schools in the south of England (48 EAL and 52 monolingual English speakers). All the children who participated in the study had been educated within the English primary school system since year 1 (age 5 to 6 years) and none of them had any special educational needs. Children with EAL and EL1 were instructed in English only in the same classes, and those in the sample did not receive pull-out instruction. Children were defined as having EAL based on school records, and this was verified through parent report on language background. The two language groups did not differ in the balance of the sexes (χ^2 (1, N=100)=0.24, p=.624). There was a nonsignificant trend towards younger age in the EAL group (t (98) = -1.75, p=.084) and higher standardised non-verbal intelligence in the EAL group (t (98)=1.91, p=.059) compared to the monolingual group. These variables were controlled in all analyses. A total of 20 languages were reported amongst the children learning EAL, with Punjabi (n=10), Urdu (n=10), Hindi (n=9) and Arabic (n=6) being the most reported languages.

Measures

The British picture vocabulary scale (BPVS)

The BPVS version 3 (Dunn & Dunn, 2009) was administered at time 1 to assess children's receptive vocabulary as an independent variable. In this test, children hear a word and identify its meaning by pointing to one of four pictures. Raw scores were used.

The clinical evaluation of linguistic fundamentals (CELF)

Six subtests from the CELF (Semel et al., 2003) were used at time 1 to measure receptive and expressive oral language skills as independent variables. Receptive language was measured with three subtests: Oral Directions, Word Classes, and Semantic Relationships. Expressive language skills were measured with three further subtests: Formulated Sentences, Recalling Sentences and Sentence Assembly. Tests were administered according to the manual.

Wechsler individual achievement test (WIAT-II)

Two subtests were selected from the WIAT-II (Wechsler, 2005) which were used at time 1 to measure children's literacy skills as independent variables. These were Word Reading and Reading Comprehension. In the Word Reading test, the speed and accuracy of children's reading is measured as they read a list of increasingly difficult words. In the Reading Comprehension test, participants must answer questions and make inferences about short texts. Raw scores were used in the main analyses.

Wechsler abbreviated scale of intelligence (WASI)

The Matrix Reasoning subtest from the WASI (Wechsler, 2011) was used at time 1 as a measure of children's non-verbal intelligence as an independent variable. Raw scores were used.

Writing ability measure (WAM)

To measure several aspects of children's writing performance as a dependent variable, the WAM (Dunsmuir et al., 2015) was used. This measure assessed children's writing performance in both fiction and non-fiction genres, specifically a narrative writing activity and an expository writing activity. In this task, children were given fifteen minutes to hand write a text in response to a prompt. For the narrative task at time 1, children were instructed to imagine and write about a school trip to any place of their choosing (prompt 1 from Dunsmuir et al., 2015), and at time 2, spending the day with a fictional character (a prompt devised for this study). For the expository task, children were instructed to describe and explain why their ideal teacher should be recruited in a letter addressed to the school's headteacher (an expository adaptation of prompt 2 from Dunsmuir et al., 2015).

Text scoring in the narrative form of the task is based on a rubric with seven domains (Dunsmuir et al., 2015): these include transcription (handwriting, spelling, punctuation) and composition (structure and grammar, vocabulary, organisation, and development of ideas). Each domain is scored from 1 to 4. Analogous criteria were adapted for the expository writing task to reflect the difference in features for this genre (see Supplementary Materials): five of the domains were exactly the same (handwriting, spelling, punctuation, structure and grammar, vocabulary), layout was analogous to organisation, and composition and effect was analogous to development of ideas. (For simplicity, these are labelled as organisation and idea development from now on.) Two trained raters who were blind to language scored 20% of the writing scripts. Inter-rater agreement for total scores was excellent ($ICC = 0.979$). The WAM total scores also showed good internal consistency in this sample for both the narrative (Cronbach's $\alpha = 0.761$) and expository ($\alpha = 0.868$) tasks.

WIAT-II spelling

The second dependent variable was the spelling subtest from the WIAT-II (Wechsler, 2005), which was used to measure transcription in a targeted way, specifically children's single-word spelling ability. In the spelling test, participants hear a series of up to 50 words, both individually and embedded within a sentence context, and are required to write down the words. Children had 30 s to write each answer before the next word was given. The raw score was out of 50.

Procedure

All children were tested in a quiet area in their school by a trained research assistant (the 2nd author). In the autumn term of 2011 (time 1), children completed two indi-

vidual testing sessions of 30 to 40 min in which they completed tasks in the following fixed order: CELF receptive, CELF expressive, WASI matrix reasoning, BPVS, LBQ, and WIAT reading comprehension. Children completed the WAM narrative task and WIAT spelling test in a group in their classroom over one or two sessions. In the summer term of 2012 (time 2), both WAM narrative and expository tasks, and the WIAT spelling test, were administered to class groups.

Results

Data cleaning & analysis

To analyse the data, missing data was first imputed, and variables assessed and transformed for skew. Missing data were as follows: 24 children (9 EAL) were missing data on the WAM narrative task at time 2, 22 due to whole class absences (e.g., trips) during the scheduled testing period, and 2 due to individual absences. Of these 24 children, 3 (2 EAL) children were also missing data on the WIAT spelling test at time 2, due to child absence; and 2 children (1 EAL) were missing all data from time 2 (i.e., including on the WAM expository task) due to students leaving the school. Children missing data did not differ from those with complete data in terms of age (t (98) = 0.07, p = .942), BPVS raw score (t (98) = 0.21, p = .835), gender balance ($X2(1$, N = 100) = 0.08, p = .774), or language group ($X2(1$, N = 100) = 1.40, p = .238). Missing data were dealt with using multiple imputation. Specifically, multiple imputation by chained equations with 10 imputations was used. All variables with missing data were imputed and gender, language, age, non-verbal reasoning, all raw language measures and WAM subscales, and LBQ measures for EAL children were included in the imputation model. The following variables showed negative skew: matrix reasoning, WIAT reading, WIAT comprehension, and BPVS. These variables were transformed by either square or cube transformations, depending on the severity of the skew. Four of the twenty-one subscale scores across the three WAM tasks (expository handwriting, expository vocabulary, expository layout, and narrative vocabulary at time 2) showed skew which could not be addressed due to a high proportion of scores at the minimum or maximum.

In the key analyses, a series of linear mixed effects models were run to examine predictors of writing performance for EAL and monolingual students, firstly in terms of the WAM total score (models 1) and subscale scores (models 2–3), and secondly in terms of decontextualised spelling (models 4–6). Due to the data having repeated-measures and multiple predictor variables to control for, data were analysed using linear mixed effects models using the lme4 package (Bates et al., 2015) in R version 4.0.2 (R Development Core Team, 2017). The sjplot package (Lüdecke, 2020) was used to generate tables and plots as well as R^2 estimates (Nakagawa et al., 2017), emmeans and emtrends were used to calculate post-hoc tests (Lenth et al., 2022). Prior to the analysis, all continuous fixed factors were centred and scaled to create z-scores, and all dichotomous fixed factors were centred so that main effects were estimated as average effects over all levels of the other variable. Multicollinearity was checked for all models and was acceptable (VIF < 5).

A hierarchical approach was taken, with 3 models per dependent variable. This was to allow us to address the three research aims of the study separately. Specifically, models 1 and 4 examined aim 1 (the effect of language group on writing skills), before controlling for other language skills. Models 2 and 5 addressed aim 2 (predictors of writing skills), and models 3 and 6 looked at aim 3 (interactions between language group and predictors).

To construct the maximal base model (Barr et al., 2013) for the most complex model predicting WAM scores (model 3), we began with a model with random intercepts by participant; fixed effects for 8 within-subjects factors (time, genre, and 6 dummy variables representing the 7 subscales of the WAM, with structure and grammar as the reference category) and 9 between-subjects factors (gender, age, language status, non-verbal reasoning, BPVS, CELF receptive, CELF expressive, WIAT reading and WIAT comprehension); random by-participant coefficients for all 8 within-subjects fixed effects; and all correlations between slopes. (Structure and grammar was used as the reference category because it was average in terms of children's performance across the 7 subscales, and so provided the most relevant contrasts). This initial model had a singular fit, so we simplified the model. The model remained singular when by-participant coefficients by subscale were included, suggesting that these models were too complex to be supported by the data. However, the model converged with random by-participant coefficients for genre and time, and this model improved on the model with no by-participant random coefficients (X^2 (5) = 88.30, $p < .001$). Thus, random intercepts for participants and random by-participant coefficients for time and genre with correlations between these random coefficients were included in all models. Random effects are reported in table S5 in the Supplementary Materials.

For the models predicting spelling on the WIAT (models 4–6), the models contained random intercepts by participant; and fixed effects for 1 within-subjects factor (time) and up to 9 between-subjects factors (gender, age, language status, non-verbal reasoning, BPVS, CELF receptive, CELF expressive, WIAT reading and WIAT comprehension) and their interactions with language status. The models would not converge when a random coefficient by-participant for time was included, so only the random intercept was used.

Descriptives and language and reading skill differences

Descriptive statistics for all measures, including oral language and reading measures and writing outcome measures, are shown for EAL and monolingual groups separately in Supplementary Materials table S2. Correlations between measures are reported in Supplementary Materials table S3. Estimated marginal means, controlling for age and non-verbal reasoning, for EAL and monolingual groups across oral language and reading measures in the study are shown in Supplementary Materials table S4.

What factors affect children's writing, and do they differ by language group?

In the first model, to address research aim 1, the effect of language status and time on WAM total writing skill was examined, as shown in Table 1 (Model 1). There was a small but significant effect of language group ($p = .028$), with estimates indicating that the monolingual children performed 0.18 points on the scale from 1 to 4 (6%) higher than the children with EAL. The model also shows an effect of time ($p < .001$), indicating an improvement in writing scores from session 1 to session 2, as well as an effect of genre indicating better overall performance in the narrative than the expository task. The control variables of matrix reasoning ($p < .001$) and gender ($p = .003$) had an effect on writing scores (in favour of higher reasoning scores and females), but there was no effect of age. Thus, overall, the EAL children perform slightly poorer at writing than the monolingual children.

In the next model (see Model 2, Table 1), to address research aim 2, subscales and remaining individual difference factors were added. After including these individual difference factors, there was no longer an effect of language group on score: thus, differences between language groups in writing skill can be explained by differences in other language skills.

Model 2 (Table 1) also demonstrates the effects of subscale and individual differences in language skills on writing across the whole sample. The estimates demonstrate that children score highest in handwriting (0.79 points (26%) higher than structure and grammar); as well as 0.20 points (7%) higher in punctuation; and 0.16 points (5%) higher in spelling, compared to structure and grammar. Children score

Table 1 Model 1 and Model 2 results predicting subscale scores

Predictors	Model 1			Model 2		
	Estimates	*CI*	*p*	*Estimates*	*CI*	*p*
(Intercept)	2.15	2.07–2.23	**<0.001**	2.15	2.08–2.22	**<0.001**
Age	0.02	-0.06–0.10	0.599	-0.03	-0.10–0.04	0.392
Gender	0.23	0.08–0.39	**0.003**	0.22	0.07–0.37	**0.005**
WASI IQ	0.14	0.06–0.22	**<0.001**	0.05	-0.03–0.13	0.247
Time	0.18	0.09–0.27	**<0.001**	0.18	0.09–0.27	**<0.001**
Genre	-0.11	-0.21 – -0.01	**0.034**	-0.11	-0.21 – -0.01	**0.034**
Language	0.18	0.02–0.33	**0.028**	0.04	-0.11–0.19	0.579
Handwriting				0.79	0.70–0.89	**<0.001**
Punctuation				0.20	0.10–0.29	**<0.001**
Spelling				0.16	0.07–0.26	**0.001**
Vocabulary				-0.26	-0.36 – -0.17	**<0.001**
Organisation				0.04	-0.06–0.14	0.417
Idea Development				-0.02	-0.11–0.08	0.735
BPVS				-0.06	-0.15–0.04	0.223
CELF Receptive				-0.06	-0.17–0.04	0.221
CELF Expressive				0.12	0.01–0.23	**0.039**
WIAT Reading				0.19	0.08–0.30	**0.001**
WIAT Comprehension				0.04	-0.07–0.15	0.454
Marginal R^2	0.060			0.257		
Conditional R^2	0.314			0.475		

equivalently on organisation and idea development to structure and grammar. However, they score lowest in terms of vocabulary, 0.26 points (9%) worse than structure and grammar. Thus, children in our sample find some sub-skills of writing more challenging than others.

In terms of language skills, expressive language skill ($p = .039$) and single word reading skill ($p < .001$) emerged as the significant predictors of writing skill across the whole sample. There was no significant contribution of receptive vocabulary, other receptive language skills, or reading comprehension.

To determine whether the factors affecting writing performance differed by language group (aim 3), interaction terms were added to the model. Interactions were added by subscale to determine whether language groups differed in specific writing skills. Because the model would not converge if all 5 interactions with language skills were included, to address this aim as well as possible, a subset of 3 of the strongest interactions were included. To do so, Pearson's correlations between the 3 total writing scores and predictors were calculated, and compared for EAL and monolingual students: predictors with differences in R values of a conservative >= 0.2 were included to check for a possible significant interaction. This model is shown in Table 2 (Model 3). There were no significant interactions between language and genre or time, indicating that EAL and monolingual children did not differ in terms of change over time, and that EAL and monolingual children found narrative and expository genres similarly challenging.

For subscale effects, there was a significant interaction between language group and organisation ($p = .046$). Pairwise comparisons using the estimated marginal means confirmed that monolingual children perform better on the organisation subscale than the comparison subscale ($t = 1.97$, $p = .049$) of structure and grammar, whereas for EAL children there was no significant difference ($t = -0.88$, $p = .380$). There were no other significant interactions between subscale and language, suggesting that EAL and monolingual children performed similarly across these other subscales.

In terms of language skills, only the interaction between language status and reading comprehension was significant ($p = .038$). There is a positive effect of reading comprehension for monolingual students, with a slight negative effect for EAL students, and the difference between these slopes was significant ($t = 2.03$, $p = .045$). Thus, reading comprehension seems to benefit monolingual students' writing more, although overall, the factors affecting writing skill are largely similar for EAL and monolingual children.

What factors affect children's spelling, and do they differ by language group?

To examine whether language groups differed in their spelling skill over time (aim 1), Model 4 (Table 3) included control variables of age, gender, and non-verbal reasoning, as well as time, language group, and time by language group interaction. There was a significant effect of time ($p < .001$), with children scoring 2.58 points (5%) higher at time 2 than time 1. There was, however, no significant effect of language, or language by time interaction. This suggests that after controlling for age, gender, and non-verbal reasoning, EAL and monolingual children did not differ in spelling ability, and this was stable over time.

Table 2 Model 3 results predicting subscale scores

Predictors	Subscore		
	Estimates	*CI*	*p*
(Intercept)	2.16	2.09–2.23	<**0.001**
Age	-0.03	-0.10–0.04	0.373
Gender	0.22	0.07–0.38	**0.004**
WASI IQ	0.04	-0.05–0.12	0.404
Time	0.18	0.09–0.27	<**0.001**
Genre	-0.11	-0.21 – -0.01	**0.034**
Language	0.02	-0.13–0.18	0.771
BPVS	-0.05	-0.15–0.04	0.292
CELF Receptive (CELF-R)	-0.05	-0.16–0.05	0.321
CELF Expressive (CELF-E)	0.09	-0.02–0.21	0.123
WIAT Reading (WIAT-R)	0.17	0.06–0.28	**0.002**
WIAT Comprehension (WIAT-C)	0.08	-0.03–0.19	0.164
Handwriting	0.79	0.70–0.89	<**0.001**
Punctuation	0.20	0.10–0.29	<**0.001**
Spelling	0.16	0.07–0.26	**0.001**
Vocabulary	-0.26	-0.36 – -0.17	<**0.001**
Organisation	0.04	-0.06–0.14	0.417
Idea Development	-0.02	-0.11–0.08	0.735
Genre * Language	-0.11	-0.32–0.09	0.270
Time * Language	0.00	-0.19–0.19	0.977
Language * Handwriting	0.03	-0.16–0.22	0.762
Language * Punctuation	0.04	-0.15–0.24	0.653
Language * Spelling	0.01	-0.19–0.20	0.944
Language * Vocabulary	0.05	-0.14–0.25	0.581
Language * Organisation	0.20	0.00–0.39	**0.046**
Language * Idea Development	0.18	-0.01–0.37	0.066
Language * CELF-E	-0.14	-0.35–0.07	0.200
Language * WIAT-R	-0.11	-0.31–0.09	0.287
Language * WIAT-C	0.23	0.01–0.44	**0.038**
Marginal R^2	0.268		
Conditional R^2	0.481		

To determine which language skills predicted spelling ability (aim 2), 5 language skill scores were added to the model (model 5, Table 3). The only predictor that emerged as significant was reading skill ($p < .001$), with a 1 SD increase in reading skill related to a 4.63 point (9%) increase in spelling score. Interestingly, adding language skills to the model caused the effect of language group to become significant ($p = .007$): in fact, it shows that after controlling for other language skills, EAL children perform *better* than their monolingual peers at spelling by 2.63 points (5%). This implies that EAL children have a relative strength in spelling single words compared to their other language skills.

Finally, model 6 (Table 4) included interactions between language group and language skills in predicting spelling score (aim 3). The only significant interaction was with BPVS ($p = .039$). This interaction suggested that whilst BPVS score had a positive effect on predicted spelling score for EAL children, this effect was negative for

Table 3 Model 4 and Model 5 predicting WIAT spelling score

Predictors	Model 4			Model 5		
	Estimates	*CI*	*p*	*Estimates*	*CI*	*p*
(Intercept)	0.00	-0.18–0.18	1.000	0.00	-0.12–0.12	1.000
Age	0.16	-0.02–0.34	0.085	0.01	-0.13–0.14	0.931
Gender	-0.08	-0.44–0.29	0.676	0.02	-0.27–0.31	0.882
WASI IQ	0.21	0.03–0.40	**0.022**	-0.06	-0.21–0.10	0.487
Time	0.39	0.26–0.51	**<0.001**	0.39	0.26–0.51	**<0.001**
Language	-0.04	-0.41–0.32	0.812	-0.39	-0.68 – -0.11	**0.007**
Time * Language	-0.09	-0.33–0.15	0.466			
BPVS				-0.02	-0.19–0.16	0.856
CELF Receptive				-0.16	-0.35–0.04	0.115
CELF Expressive				0.14	-0.08–0.35	0.207
WIAT Reading				0.69	0.49–0.89	**<0.001**
WIAT Comprehension				0.08	-0.12–0.29	0.425
Marginal R^2	0.116			0.525		
Conditional R^2	0.814			0.815		

Table 4 Model 6 predicting WIAT spelling score

Predictors	Model 6		
	Estimates	*CI*	*p*
(Intercept)	0.05	-0.08–0.18	0.447
Time	0.39	0.26–0.51	**<0.001**
Language	-0.39	-0.68 – -0.11	**0.006**
Age	0.02	-0.11–0.15	0.768
Gender	-0.02	-0.31–0.27	0.899
WASI IQ	-0.06	-0.22–0.10	0.470
BPVS	-0.04	-0.23–0.14	0.639
CELF Receptive	-0.13	-0.33–0.07	0.190
CELF Expressive	0.13	-0.09–0.36	0.240
WIAT Reading	0.64	0.43–0.84	**<0.001**
WIAT Comprehension	0.11	-0.10–0.33	0.294
Language * BPVS	-0.37	-0.71 – -0.02	**0.039**
Language * CELF Receptive	0.16	-0.21–0.52	0.393
Language * CELF Expressive	-0.37	-0.80–0.07	0.100
Language * WIAT Reading	0.16	-0.24–0.57	0.434
Language * WIAT Comprehension	0.19	-0.21–0.59	0.357
Marginal R^2	0.547		
Conditional R^2	0.818		

monolingual children and the difference between slopes was significant ($t=0.206$, $p=.042$). This suggests that after controlling for other – higher-level – language skills, monolingual children who score higher on receptive vocabulary do not perform better in terms of spelling.

Discussion

With regard to the primary aim to identify whether children with EAL differ in their writing skills relative to monolingual English-speaking children, the data suggested that EAL children performed slightly poorer at writing in English than monolingual children before controlling for other language skills. Previous studies had found mixed results in this regard (Babayiğit, 2014; Camping et al., 2020; Danzak, 2020; Harrison et al., 2016; Herbert et al., 2020). Unlike these studies, age, gender, and non-verbal intelligence were controlled here: this is important, as in our sample we found a trend towards higher non-verbal intelligence in the EAL students, which could have masked differences in previous research. This suggests that overall, EAL students evidence more difficulty with their English writing than monolingual students. However, our data further suggest that EAL student's poorer writing performance is commensurate with their other language skills: after controlling for vocabulary, receptive and expressive language, decoding and reading comprehension skill, there was no difference between groups in writing scores. Thus, this study is the first to suggest that EAL students do not have a *specific* challenge with English writing, but instead their writing abilities are in line with their difficulties in oral language and reading in English.

The longitudinal component of this study demonstrated that EAL and monolingual children improve in their narrative writing skills over time, but there was no evidence that the amount of improvement differed between EAL and monolingual children. This suggests that the rate of improvement over the school year is roughly consistent between the two language groups. This supports cross-sectional research with other language skills (e.g. vocabulary depth, Booton et al., 2021) and one longitudinal study of writing (Herbert et al., 2020) which suggest that there is a similar skill gap between EAL children and their peers at different grades. This similar rate of learning is problematic, as it suggests that the existing gap between EAL students and their peers would be maintained over time and could contribute to the gap in writing attainment (Department for Education, 2012; Hessel & Strand, 2021).

Certain genres and sub-skills of writing were also found to be more challenging for children, but there was little evidence that this pattern differed between EAL and monolingual children. Children showed better overall performance in the narrative than the expository task, but there was no evidence that this differed between EAL and monolingual children. This is consistent with the findings that EAL children struggle with elements of non-fiction writing (Cameron & Besser, 2004), but it does not support the hypothesis that EAL children would show a specific disadvantage compared to monolingual children (Riches & Genesee, 2006). Children in our sample also seemed to find some specific writing sub-skills more challenging than others: specifically, children scored more highly on elements of transcription (handwriting, punctuation, and spelling) compared to structure and grammar, and scored lowest on effective use of vocabulary. Overall, the level of challenge of each of these sub-skills was similar for EAL and monolingual children, except that monolingual children performed better on the organisation or layout subscale than EAL children. This supports previous research which found lower performance for EAL students on composite scores which included organisation (Babayiğit, 2014; Camping et al., 2020).

In terms of single-word spelling, EAL children showed a relative strength compared to their monolingual peers after controlling for other language skills, and this was consistent over the two time points. As in the previous studies addressing this question (Harrison et al., 2016; Herbert et al., 2020; Wang & Geva, 2003), we had found no difference between the groups before considering their other language skills, suggesting that this is an area of relative rather than absolute strength. However, note that there was no interaction between language group and spelling within a writing assignment: taken together, these findings could suggest that while EAL children can spell well when this is the only focus, this skill may not be translated to a real writing task where other components of writing must be co-ordinated. Children also improved over time at spelling but there was no evidence that the rate of improvement differed between groups, implying that we might expect EAL children to maintain their relative advantage in spelling over time.

In terms of the secondary aim of examining predictors of writing skill, expressive language skills and single word reading uniquely predicted writing, whereas there was no additional effect of receptive vocabulary, other receptive language skills, or reading comprehension. A meta-analysis suggested significant bivariate correlations of oral language and vocabulary with second language learner's writing skills (Graham & Eslami, 2020), so the effect of vocabulary may have been reduced here due to controlling for other factors. It also seems that expressive more than receptive oral language skills are important for writing, which is logical given that writing requires expressive use of language. Furthermore, the impact of these language skills appeared to be similar across language groups. One previous study had suggested that receptive vocabulary predicted writing skills for monolingual but not EAL children (Harrison et al., 2016), but did not statistically test for this interaction: when we tested this statistically we found no interaction in our data. We did, however, find an interaction between language group and reading comprehension skills, which implied that reading comprehension had a greater relationship with writing in monolingual students, whereas this result trended in the opposite direction for EAL students. This suggests that good text comprehension might lay a foundation for effective writing for monolingual children, but that for EAL children, good understanding of text is a separable skill which does not necessarily lead to improved writing.

For spelling skill, single-word reading was the only unique predictor. The impact of word reading on spelling for EAL students is supported by previous studies which controlled for L1 reading and spelling skills (Li et al., 2012; O'Brien et al., 2020), and here we show that after controlling for L2 language and literacy skills, this relationship is also maintained. It supports the link between decoding and single-word spelling, which is likely due to a similar basis in phonological awareness (Strattman & Hodson, 2005). The only significant interaction that emerged between language group and language skills in affecting spelling was receptive vocabulary: this suggested that, after controlling for other language skills, monolingual children with higher receptive vocabulary scored lower on spelling skill, but this was not the case for EAL students. This sounds counter-intuitive at first but could indicate that monolingual children with high receptive vocabulary relative to other, more complex language skills (e.g., expressive oral language, reading), have poorer ability to apply their vocabulary in more challenging tasks such as spelling. However, as interactions

were relatively underpowered in this study, more data would be helpful to ascertain the reliability of this finding.

The results presented here have implications for teaching and learning of writing skills for EAL and monolingual students and narrowing the attainment gap between these groups (Department for Education, 2012; Hessel & Strand, 2021). For all students, they suggest that more practice with writing non-fiction texts relative to narratives could improve children's writing skills, as well as targeting effective vocabulary use, whereas spelling, punctuation, and grammar may be an area of strength. The results also imply that decoding and expressive oral language skills relate to better writing, and thus activities that support these skills may have benefits for writing. For EAL students, the findings suggest that composition sub-skills of writing should be a focus, particularly structuring of texts, as well as applying their strong spelling skills within broader writing tasks. Furthermore, the results also imply that EAL students do not find writing disproportionately challenging, but instead that they show challenges with language and literacy across many areas: thus, it is critical that practitioners also support other language skills, including receptive vocabulary which was a further predictor of writing skill for EAL students.

The present study has some limitations. Whilst the sample size was comparable to other studies comparing factors affecting monolingual and EAL children (Harrison et al., 2016), it was not sufficient to sustain random slopes for all variables in the mixed effects models, and interactions between language group and other between-subjects factors were underpowered. An additional limitation was that only one prompt was used for each genre and time point: some research has suggested that bilingual student's performance varies by topic more so than by genre (Danzak, 2011), so future studies could include more than one prompt per time point. Furthermore, only English writing was assessed, so this study cannot comment on the development of children's writing skills in their home language(s).

In future research, longitudinal studies over more extended periods to track the trajectory of writing and other skills in EAL students would be informative about rates of learning. More studies evaluating techniques for improving EAL children's writing and other language and literacy skills, particularly in a UK context, are needed (Murphy & Unthiah, 2015; Oxley & de Cat, 2019) and such intervention designs could demonstrate whether the links between other language skills and writing are causal in a way that correlational studies cannot. Our data suggests that interventions particularly likely to improve EAL student's writing could focus on composing expository or other non-fiction texts, structuring text, effective vocabulary use in writing, expressive oral language and decoding.

In conclusion, this study demonstrated that students with EAL do not have a specific deficit with writing, but that their writing in English is poorer relative to the monolingual peers in line with their more limited other English language and reading skills. Like their peers, EAL students especially struggle with expository texts and effective use of vocabulary in their writing, but also seem to have particular trouble with text organisation. The findings also showed that EAL students have a relative strength in single-word spelling, but that this skill is not readily transferred to spelling within a writing task. Furthermore, for all students, decoding skill was a unique predictor of spelling and writing, whilst expressive oral language predicted writing.

The findings suggest broadly similar predictors of writing and spelling between EAL children and monolinguals. Thus, a range of factors affect EAL student's writing performance, including genre, writing sub-skill, decoding, expressive oral language, and receptive vocabulary, suggesting a number of possible targets for educational interventions.

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Declarations

Competing interests The authors have no competing interests to declare.

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