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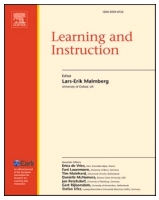

Achievement gaps for English learners with disabilities

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ABSTRACT

Background: In England, the number of English as an Additional Language (EAL) learners has been increasing. While prior research has explored the educational outcomes of EAL learners and students with special educational needs and disabilities (SEND), the intersection of these two groups remains under-researched.
Aims: This study aims to analyse the impact of EAL status and SEND on student achievement in reading, writing, and mathematics.
Samples: The study utilizes data from the National Pupil Database, focusing on approximately 2.5 million Year 6 students in England, including around 360,000 students identified with SEND across four academic years (2015–2019).
Methods: The study employs multilevel modelling to examine the main effects and interactions of EAL status, SEND, gender, and prior attainment on student achievement in reading, writing, and mathematics.
Results: The findings reveal that EAL students tend to catch up with their non-EAL peers in academic performance over time. However, EAL students with SEND face persistent challenges, particularly in reading. The study also highlights the heterogeneous nature of SEND, with varying impacts of EAL status across different SEND categories.
Conclusions: The study underscores the importance of early intervention and targeted support for EAL students with SEND. It emphasizes the need for tailored educational strategies that address the unique challenges faced by this diverse group of learners. The findings have implications for educational policy, practice, and research, advocating for a more nuanced understanding and approach to supporting the educational needs of EAL students with SEND.

In England, the proportion of students attending schools whose first language is not English has grown from 7.6% in 1997 to 20% in 2023 (Department for Education, 2023), highlighting the increasing presence of English as additional language learners (EALs) in English schools. A substantial body of research has explored how various factors—such as EALs gender, ethnicity, socioeconomic status, and pupil mobility—predict their educational outcomes (Demie, 2001; Demie, 2002; Sammons, 1995; Strand, 1999). However, the intersection of EAL status and special educational needs and disabilities (SEND) remains underexplored in the UK. This study seeks to address this gap by analysing the association between EAL status and SEND on student achievement in reading, writing, and mathematics, aiming to provide nuanced insights into the educational achievements of these uniquely positioned learners.

Understanding how EAL status and SEND interact is crucial, as the combination of language learning needs and disabilities may present unique challenges that can exacerbate achievement gaps. Language barriers can complicate the accurate identification of SEND among EAL students, potentially leading to misdiagnosis or delayed support (Artiles et al., 2005; Strand & Lindsay, 2009). Cultural and linguistic differences may also affect how EALs with SEND engage with the curriculum and how educators perceive and address their needs (Artiles et al., 2005). Moreover, educational pedagogies effective for monolingual students with SEND may not be as effective for EALs, who may require an additive approach to teaching that is characterised by incorporating additional content, topics, and perspectives—including multicultural viewpoints—to address both their language development and learning difficulties (Vaughn et al., 2023).

1. EAL and academic achievement

Past studies indicate a considerable duration, typically spanning 4–7 years, is necessary for EAL learners across age groups to attain the same academic performance level as native English-speaking peers on standardised assessments (Collier, 1987; Demie, 2013; Hakuta et al., 2000;

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Strand & Hessel, 2018). This extended timeline is reflected in findings from England, which have consistently reported initial disparities in educational progress between EAL and non-EAL students during early primary school years. However, these early academic differences tend to diminish as EAL students make considerable progress in later years of schooling. For instance, Strand et al. (2015) report that 44% of EAL pupils demonstrated achievement benchmarks at age 5, compared to 54% of non-EAL pupils. The odds ratio (OR) indicating the association between being an EAL pupil and lower achievement was reported to be significant at age 5 (OR = 0.67), but this association diminished with age, reaching OR = 0.73 at age 7, OR = 0.81 at age 11, and further narrowing by age 16 to OR = 0.90, indicating effective educational catch-up by EAL learners over time. Moreover, Strand and colleagues (2015) observe no significant gap by the end of high school, underscoring the close convergence in educational outcomes between EAL and non-EAL students.

Similarly, Strand and Hessel (2018) observed that a substantial percentage of EAL pupils, particularly in early education stages, have limited English proficiency, with more than half of EAL pupils at the end of Reception still acquiring basic language skills. By Key Stage 4 (i.e., Year 10), however, the majority (85%) attain competence or fluency, demonstrating that while initial disparities are significant, they diminish as students' English-level proficiency improves, leading to enhanced educational outcomes over time. Other studies in England have also reported EAL learners effectively catching up or outperforming their non-EAL peers by the end of secondary school (Demie, 2018; Demie & Strand, 2006; Kingdon & Cassen, 2010). Kingdon and Cassen (2010) suggest that the potential reasons for marked improvement in EAL pupils' academic performance in later years may be attributed to immigrant populations' cultural emphasis on educational achievement or heightened academic motivation to succeed. Additionally, some research suggests that bilingualism itself may contribute to this academic growth, as it has been linked to enhanced attentional control, metalinguistic awareness, and abstract reasoning abilities (Adesope et al., 2010).

While past studies suggest cultural and cognitive benefits of being an EAL learner, the educational system's response to the unique needs of EAL learners is more complex. As Costley (2014) notes, educational frameworks in England lack specific support mechanisms for EAL students. For instance, a significant focus of teacher training during the early phases of mainstreaming is predominantly on teaching Standard English rather than addressing the unique needs of EAL learners. This emphasis on Standard English suggests that teacher training programs often do not adequately differentiate between the diverse language learning trajectories of students who speak a language other than English at home (Costley, 2014). As EAL students are absorbed into the standard curriculum without specific support, it inadvertently sets the stage for them to catch up over time as they adapt to the educational system which is demonstrated in past studies' findings (e.g., Strand et al., 2015).

It is important to highlight that despite the lack of a distinct EAL focused curriculum in English schools, the National Curriculum Framework in England (Department for Education, 2014) acknowledges that "the ability of pupils for whom English is an additional language to take part in the national curriculum may be in advance of their communication skills in English" and expects teachers to provide the necessary support for their full participation. Additionally, Ofsted guidance for Initial Teacher Education inspections (Ofsted, 2024) explicitly requires teacher training programs to equip future teachers with the knowledge and skills to meet the needs of at-risk student populations such as pupils with SEND and pupils for whom English is not their first language. The emphasis on EAL and SEND in teacher training reflects a growing recognition of the importance of addressing the unique linguistic, cultural, and additional needs of these learners, even within a mainstream curriculum. Nevertheless, the actual implementation and effectiveness of these policies in bridging the initial educational disparities remain a subject of ongoing research and debate (Costley, 2014).

2. EAL, SEND, and academic achievement

Given the growth in EAL pupils' academic performance in later schooling years, one would expect that this would also apply to EAL pupils identified with SEND. However, existing research in England has highlighted significant academic challenges faced by students with SEND who are also EALs. Strand et al. (2015) observed students with SEND who are also EAL learners consistently underperform, compared to their SEND peers who are native English speakers, across key subjects such as reading and mathematics. Similar findings have also been reported in the United States (Cooc, 2023; Rhinehart et al., 2024). Cooc (2023) observes that EAL students with SEND score lower than their non-EAL peers with SEND in both math and reading. However, Cooc (2023) reports some evidence that these achievement gaps narrowing in recent years, partly due to improvements among EAL students with SEND and slight declines in achievement among non-EAL students with SEND. Despite this progress, significant academic disparities remain. For instance, in 2020, the gap in math scores between EAL and non-EAL students with SEND was approximately 0.65 standard deviations, and the gap in reading scores was about 0.60 standard deviations (Cooc, 2023).

While the work of past researchers demonstrates that EAL students with SEND lag behind their non-EAL peers with SEND in various academic domains, past studies have not investigated whether the magnitude and direction of these differences remain consistent across different disability subtypes and EAL status. Thus, the focus of the current study is to address this gap in the literature by analysing data for Year 6 students across four cohorts in England. This study reports on the differences in reading, math, and writing achievement between students with EAL and non-EAL status across different disability subtypes, aiming to provide a more nuanced understanding of these educational disparities and to inform targeted interventions.

3. Method

3.1. Data source

This study utilised the National Pupil Database (NPD), a comprehensive repository of student-level data maintained by the Department for Education in England. The NPD collects annual information on individual students and educational institutions within the state-funded school system. This research specifically analysed NPD data from the 2015–16 to 2018-19 academic years, focusing on four cohorts of students enrolled in Year 6 (i.e., Grade 6) across English schools. The average pupil age in the dataset was 10 years. In total, the study examined data for approximately 2.5 million Year 6 students, including roughly 360,000 students identified as having SEND. See Table 1 for

Table 1
Descriptive Statistics for Year 6 pupils from 2015 to 2018.

Variable	N	Reading		Writing		Math	
		M	SD	M	SD	M	SD
Gender							
- Male	1261581	103.23	8.26	104.65	8.06	104.44	7.50
- Female	1208648	104.96	8.11	106.65	7.70	103.93	7.07
SEND Status							
- SEND	364551	96.66	8.90	97.44	7.86	97.32	8.02
- Non-SEND	2105685	105.15	7.55	106.84	7.22	105.19	6.61
EAL Status							
- EAL	493450	102.97	8.45	106.64	8.29	105.00	7.43
- Non-EAL	1953313	104.35	8.14	105.38	7.84	103.98	7.24

Note: SEND = Special Educational Needs and Disabilities; EAL = English as an Additional Language Learner.

descriptive statistics for reading, writing, and math scores by student demographic variables such as gender, SEND status and EAL status. Detailed counts of students within each SEND category are provided in Daniel (2024).

3.2. Measures

Outcome Variables. In England, Year 6 students undergo standardised assessments in reading, mathematics, and writing as a measure of their attainment in these core subjects. The primary purpose of these assessments is to measure pupils' attainment and progress, ensuring that schools are held accountable for their educational provision. The results are widely used by schools, parents, and government officials to inform educational decisions, guide policy development, and monitor the effectiveness of teaching and learning practices (Whetton, 2009). For reading, students complete a reading assessment that evaluates their comprehension skills through increasingly challenging texts. Mathematics skills are assessed across two assessments. One assesses students' arithmetic skills (e.g., 2 × 4 x 30 = ?) and the other assesses their mathematical reasoning skills (e.g., Write the number that is one thousand more than 19,039). Finally, writing skill assessment includes two different assessments as well. The first assessment focuses on grammar, punctuation, and spelling (GPS; e.g., given a sentence, students need to "Insert a comma in the correct place"). The second writing assessment focuses on spelling. For each academic skill, raw assessment scores are converted to scaled scores ranging from 80 to 120, following the Standards & Testing Agency guidelines (Standards and Testing Agency, 2016). This study utilised scaled scores in the analyses. The Office of Qualifications and Examination Regulations, which examines and regulates assessments in England, reports the following Cronbach's alpha values for the standardised tests: 0.96 for Mathematics and 0.91 for English (reading and writing combined) (Opposs & He, 2011).

3.3. Independent variables

Student-level Factors. The key focus of this analysis within the NPD was the categorical variable defining a student's primary SEND. The NPD categorises students into 13 distinct SEND types, which inform the provision of educational services. However, for this study, certain SEND categories were combined due to small sample sizes. Specifically, students identified with severe, profound and multiple learning or intellectual disabilities were grouped together as having intellectual disabilities. Additionally, smaller subgroups within the dataset, namely physical disabilities, multisensory impairments, and those receiving SEND support without a formal diagnosis (NSA), were aggregated into an "other" category. Please refer to Appendix D for the coefficients of all 13 SEND categories.

Other variables included in the analyses were students' gender and the EAL status. Students who speak a language other than English as their first language at home fall under the EAL classification. The classification of EAL within the NPD presents limitations that may obscure the needs of this diverse group. The broad categorisation encompasses both students who are second or third-generation migrants, potentially fluent in English, and those who are recent arrivals with little to no English proficiency. This distinction is critical as the latter group is likely to face more significant educational hurdles due to language barriers, necessitating tailored educational interventions.

The NPD also provides access to students' prior attainment in reading, math, and writing skills. The scores represent students' Year 2 (i.e., Grade 2; 6- to 7-year-old pupils) scores in reading, math, and writing skills (Standards and Testing Agency, 2020). By incorporating these scores, the models can more accurately account for individual differences in prior academic performance, thereby improving the precision of the estimates for the effects of other variables such as gender, EAL status, and SEND status. See Appendices for correlations between Year 6 and Year 2 reading, writing, and math scores for the entire sample, for the EAL subgroup, and for the non-EAL subgroup in the dataset. Finally, this study included data from four cohorts of Year 6 students from the academic years 2015–16 to 2018–19, allowing for an analysis that captures trends over multiple years.

3.4. Data analyses

Given that students were nested within over 2000 schools across England, initial analyses involved running empty (intercept-only) models to assess the intraclass correlation (ICC). The ICCs for reading, writing, and math ranged from 0.07 to 0.12, indicating substantial school-level variation and justifying the use of multilevel models. As shown in Table 2, three sets of linear mixed-effects models were fitted for each outcome (reading, writing, math). Model 1 examined the main effects of gender, EAL status, SEND status, and academic/cohort year, while controlling for school-level variations. Model 2 extended Model 1by including students' prior attainment in each academic skill as a covariate to account for pre-existing differences in achievement. Model 3 further elaborated on Model 2 by introducing interaction terms between EAL status and SEN status, and between gender and SEN status to explore potential subgroup differences.

A subsequent set of analyses, as shown in Table 3, replicated this three-model sequence, but replaced the binary SEND variable with a categorical variable representing different SEND subtypes, allowing for a more granular examination of SEND subgroup differences and interactions with EAL status. All models consistently included a random intercept for school to account for the hierarchical data structure.

Empty Model: $\text{Outcome}_{ij} = \gamma_{00} + u_{0j} + \epsilon_{ij}$

Where γ_{00} is the fixed intercept, u_{0j} is the random effect for school j, and ϵ_{ij} is the residual error for individual i within school j.

$$\text{Model 1Outcome}_{ij} = \gamma_{00} + \gamma_{01}\text{Gender}_{ij} + \gamma_{02}\text{EAL}_{ij} + \gamma_{03}\text{SEND}_{ij} + \gamma_{04}\text{Cohort}_{ij} + u_{0j} + \epsilon_{ij}$$

Where γ_{01},γ_{02},γ_{03},γ_{04} are the fixed effects for Gender, EAL status, SEND status, and cohort, respectively.

$$\text{Model 2Outcome}_{ij} = \gamma_{00} + \gamma_{01}\text{Gender}_{ij} + \gamma_{02}\text{EAL}_{ij} + \gamma_{03}\text{SEND}_{ij} + \gamma_{04}\text{Cohort}_{ij} + \gamma_{05}\text{Year2 Score}_{ij} + u_{0j} + \epsilon_{ij}$$

Where γ_{05} is the fixed effect for students' Year 2 Score in the outcome subject area.

$$\text{Model 3:Outcome}_{ij} = \gamma_{00} + \gamma_{01}\text{Gender}_{ij} + \gamma_{02}\text{EAL}_{ij} + \gamma_{03}\text{SEND}_{ij} + \gamma_{04}\text{Cohort}_{ij} + \gamma_{05}\text{Year2Score}_{ij} + \gamma_{06}(\text{EAL} \times \text{SEND})_{ij} + \gamma_{07}(\text{SEND} \times \text{Gender})_{ij} + u_{0j} + \epsilon_{ij}$$

Where γ_{06} and γ_{07} represent the interaction effects between EAL and SEND, and SEND and Gender, respectively.

4. Results

4.1. Differences in academic achievement for students with and without SEND and their EAL status

The results from Model 1 (see Table 2) show significant main effects for students with SEND across academic domains. Controlling for gender, EAL status, and cohort, students with SEND performed approximately 8 standard points lower in reading and math, and 9 standard points lower in writing. However, controlling for prior attainment in Year 2 (Model 2), these differences were attenuated, but remained significant. This significant reduction in the estimated effect of SEND status underscores the importance of accounting for prior academic performance to better understand its impact on later academic achievement.

Notably, controlling for Year 2 reading scores alters the direction of the effect for EAL status on reading achievement. While Model 1 indicated a negative association ($\gamma = -1.54$), Model 2 revealed a positive

Table 2
Multi-level model estimates for the effects of gender, EAL, and SEND status.

Effects	Model 1			Model 2			Model 3		
	Reading	Math	Writing	Reading	Math	Writing	Reading	Math	Writing
Fixed Effects									
Intercept	104.39	102.94	105.28	81.19	79.62	82.84	81.26	79.67	82.90
Male	−1.15	1.10	−1.34	−0.34	0.59	0.11	−0.46	0.50	0.01[a]
SEND	−8.37	−8.04	−9.19	−2.46	−2.71	−3.24	−3.02	−3.22	−3.74
EAL	−1.54	0.78	0.93	0.51	2.08	2.62	0.55	2.06	2.62
2016-17	1.53	1.12	1.95	1.23	0.93	1.60	1.23	0.93	1.60
2017-18	2.47	1.32	2.14	1.87	0.86	1.49	1.87	0.87	1.49
2018-19	2.20	2.32	2.68	1.12	1.37	1.47	1.12	1.37	1.47
Year 2 Read				1.34			1.34		
Year 2 Math					1.41			1.41	
Year 2 Writing						1.40			1.39
SEND x EAL							−0.37	0.19	−0.06[a]
SEND x Male							0.99	0.77	0.81
Random Effects									
School	3.39	5.33	4.56	1.77	3.48	2.55	1.78	3.50	2.57
Residual	56.94	44.11	50.38	36.12	25.27	29.26	36.09	25.25	29.25

SEND = Special educational needs and disabilities. EAL = English as an additional language learner.
[a] Values $p > .01$; not significant.

Table 3
Multi-level Model Estimates for the Effects of Gender, EAL, and various SEND Categories.

Effects	Model 1			Model 2			Model 3		
	Reading	Math	Writing	Reading	Math	Writing	Reading	Math	Writing
Fixed Effects									
Intercept	105.90	104.08	106.93	82.23	80.33	83.97	82.23	80.33	83.97
Male	−1.20	1.06	−1.40	−0.34	0.58	0.07	−0.34	0.58	0.07
EAL	−1.45	0.85	1.01	0.55	2.11	2.64	0.57	2.09	2.65
ASD	−3.96	−4.61	−3.65	−1.26	−1.68	−0.12	−1.15	−1.72	−0.11
HI	−4.57	−3.96	−4.08	−1.43	−1.04	−0.88	−1.25	−0.97	−0.74
ID	−10.66	−10.09	−11.37	−3.26	−3.39	−4.18	−3.26	−3.42	−4.18
Other	−5.95	−6.44	−6.90	−1.74	−2.29	−2.33	−1.69	−2.31	−2.27
SEMH	−4.49	−4.84	−5.38	−1.90	−2.25	−2.44	−1.92	−2.28	−2.44
SLCN	−9.30	−8.20	−9.38	−2.89	−2.35	−2.97	−2.89	−2.46	−3.02
SPLD	−8.24	−7.67	−10.17	−1.90	−2.51	−4.03	−1.87	−2.51	−4.02
VI	−3.43	−3.68	−4.65	−0.40	−1.03	−1.57	−0.35	−1.07	−1.45
Year 2 Read				1.34			1.34		
Year 2 Math					1.41			1.41	
Year 2 Writing						1.40			1.40
ASD x EAL							−1.22	0.34	−0.09[a]
HI x EAL							−0.85	−0.31	−0.68
ID x EAL							−0.04[a]	0.14[a]	−0.01[a]
Other x EAL							−0.33	0.09[a]	−0.48
SEMH x EAL							0.24[a]	0.31	0.05[a]
SLCN x EAL							0.009[a]	0.45	0.21
SpLD x EAL							−0.36	−0.01[a]	−0.13[a]
VI x EAL							−0.28[a]	0.20[a]	−0.61[a]
Random Effects									
School	3.96	6.21	5.56	1.84	3.63	2.77	1.84	3.62	2.77
Residual	57.10	44.28	50.53	44.28	25.46	25.45	50.53	25.45	29.48

ASD = Autism spectrum disorder; HI = Hearing impairment; ID = Moderate, Severe and Profound intellectual disabilities; SEMH = Socio-emotional mental health needs; SLCN = Speech, language, and communication needs; SpLD = Specific learning difficulties/disabilities; VI = Visual impairments; SEND = Special educational needs and disabilities; EAL = English as an additional language learner. SEND comparison group is non-SEND pupils.
[a] Values $p > .01$; not significant.

association ($\gamma = 0.51$). This reversal indicates that the initial lower performance of Year 6 EAL students could be largely attributed to factors captured by their prior attainment scores, rather than being an inherent disadvantage.

In Model 3, the negative coefficient for the interaction between SEND and EAL in reading ($\gamma = -0.37$) indicates that EAL students with SEND perform worse in reading compared to what would be expected based on the main effects of EAL and SEND alone. This suggests that the compounded effects of having both SEND and being an EAL pupil are particularly detrimental to reading outcomes. Conversely, the positive coefficient in math ($\gamma = 0.19$) implies that EAL students with SEND perform better in math compared to what would be expected based on the main effects of EAL and SEND alone. This positive interaction effect indicates that the challenges associated with being an EAL student with SEND are less pronounced in math, potentially due to differing demands of language proficiency in math versus reading tasks. In writing, the interaction between SEND and EAL status was not significant.

4.2. Differences in academic achievement for EAL status and different SEND categories

The multilevel model estimates for the effects of gender, EAL status, and various SEND categories on reading, math, and writing are presented in Table 3. The results indicate that all SEND categories perform

below their non-SEND peers across all three academic domains. However, similar to results in Table 2, controlling for prior academic achievement attenuates this achievement gap.

In Table 3, model 3 introduces interaction terms to explore the differential effects of EAL status across various SEND categories. The interactions reveal differences in academic outcomes for these subgroups. For students with autism spectrum disorders (ASD), the negative interaction term for EAL learners ($\gamma = -1.22$) suggests that having both ASD and EAL status amplifies the negative impact of ASD on reading scores compared to students with ASD who are non-EAL learners. In other words, the combination of ASD and EAL presents an additional challenge for reading proficiency beyond what either factor would indicate alone. However, in math, the interaction term is positive ($\gamma = 0.34$), suggesting that students with ASD who are also EAL perform slightly better in math compared to their non-EAL peers with ASD. In writing, the interaction term was not statistically significant suggesting that EAL status does not significantly impact writing performance for students with ASD.

For students with hearing impairments, the interaction terms for EAL are consistently negative across reading, math, and writing. These results indicate that the combination of hearing impairment and EAL status presents significant challenges across reading, math, and writing skills. The negative interaction terms suggest that the combined effect is greater than the sum of the individual effects, highlighting the need for targeted support for students with both hearing impairments and EAL status. For students with speech language and communication needs (SLCN), the interaction terms for EAL are mixed. The positive coefficient in math ($\gamma = 0.45$) and writing ($\gamma = 0.21$), suggests EAL students with SLCN perform slightly better in math and writing compared to their non-EAL counterparts with SLCN. Finally, for students with specific learning difficulties (SpLD), the interaction terms for EAL are significant and negative in reading ($\gamma = -0.36$), however, EAL students with SpLD do not demonstrate differences in math and writing performance compared to their non-EAL peers with SpLD.

It is important to also highlight that although Table 2 showed no significant interaction between SEND and EAL status in writing skills, however the additional analyses in Table 3 suggests differences in writing outcomes for specific SEND categories. These findings highlight the complex interplay between EAL status and different types of SEND, underscoring the necessity for tailored educational strategies to support these diverse student groups effectively.

4.3. Gender and SEND status

As shown in Table 2, the interaction between SEND status and gender were significant across the three academic outcomes. These positive coefficients indicate that male students with SEND perform better in reading, math, and writing compared to female students with SEND, suggesting that gender plays an important role in moderating the academic impact of SEND status on students' academic achievement. However, the mitigating effect of gender on academic outcomes is relatively small and the overall impact of SEND on academic achievement remains largely negative regardless of gender.

4.4. Effects of cohort

As shown in Table 2, cohort effects reveal notable variations in academic outcomes across different years. Compared to the reference cohort of Year 6 students from the 2015-16 academic year, the 2016–17, 2017–18, and 2018–19 cohorts demonstrated progressively higher positive effects in reading, math, and writing, suggesting a trend of improving academic outcomes over successive cohorts. These coefficients indicate that students in later cohorts performed better across all three subjects compared to the 2015–16 cohort, suggesting improvements in educational outcomes for all Year 6 pupils over time.

5. Discussion

The goal of this study was to explore the association of EAL and SEND status on students' achievement in reading, math, and writing. Utilising the NPD for Year 6 students across four cohorts in England, the study employed multilevel models to examine the main effects and interactions between EAL status, SEND, and other demographic factors, while controlling for prior attainment and cohort effects. The findings highlight variations in academic outcomes among EALs with SEND, emphasising the need to consider their diverse identities to provide more equitable support.

The current study's findings align with previous research in the UK demonstrating that EAL students in later years of schooling tend to perform similarly to, or even outperform, their non-EAL peers in reading, math, and writing (e.g., Strand et al., 2015). This convergence in academic outcomes supports the notion of "catching up" among EAL students as they progress through the English education system. One explanation for this phenomenon could be the acquisition of English language proficiency over time, which facilitates EAL students' access to and engagement with the curriculum (Strand & Hessel, 2018). Additionally, factors such as increased exposure to English in academic and social contexts, as well as targeted support from schools and educators, may contribute to this narrowing of the achievement gap (Calderón et al., 2011).

The findings also underscore the crucial role of early intervention in mitigating later academic achievement gaps between students with SEND and their non-SEND peers in reading, writing, and math, and between EAL and non-EAL peers in reading (Strand & Hessel, 2018). The attenuation of these achievement gaps when controlling for prior attainment in Year 2 highlights the importance of addressing early learning difficulties and providing targeted support to ensure that all students have a solid foundation for future academic success. Early intervention programs that focus on language development, literacy skills, and foundational math concepts can be particularly beneficial for EAL students and those with SEND, helping them to bridge the gap and reach their full potential (Richards-Tutor et al., 2016). For instance, multiple past studies have reported that early intervention supports in academic skills such as reading can have long lasting positive impact on students' academic outcomes especially among at-risk learners such as those with SEND (e.g., Daniel et al., 2021; Suggate, 2016). Furthermore, studies have indicated that early academic interventions have more substantial positive effects on enhancing EAL students' academic outcomes compared to interventions implemented in later years of schooling (Ludwig et al., 2019; Richards-Tutor et al., 2016).

A key finding from the current study was that EAL learners, on average, performed better in mathematics than in reading when compared to their monolingual peers. These results align with previous research, which has demonstrated a wider academic achievement gap for EALs learners with SEND in reading than in mathematics, relative to their monolingual peers with SEND (e.g., Cooc, 2023; Ercikan et al., 2015; Filippi et al., 2024; Fry, 2007). This disparity can be attributed to reading being a language-intensive skill that requires strong abilities in comprehension, vocabulary, and syntax, areas where EAL learners frequently encounter challenges. Studies have demonstrated that EAL students often struggle with language processing, particularly in aspects like pragmatics and inferencing, which are essential for reading comprehension (e.g., Kieffer and Vukovic, 2012; Lesaux et al., 2010; Mancilla-Martinez & Lesaux, 2010). In contrast, there is some evidence that EAL learners may experience cognitive benefits due to their bilingualism, which has been associated with improved performance on executive function and arithmetic tasks (Adesope et al., 2010; Hartanto et al., 2018); however, these findings are context-dependent (see Ware et al., 2020).

The findings presented in Table 3 emphasise the importance of understanding the heterogeneous nature of the SEND population and the differential impact of EAL status across various SEND categories. For

instance, the negative interaction effect for EAL students with ASD in reading, contrasted with the positive interaction in math, underscores the need for targeted interventions that address the unique challenges and strengths associated with both ASD and EAL status. Similarly, the consistently negative interaction for EAL students with hearing impairments across all three academic domains highlight the amplified challenges faced by this subgroup of Year 6 students. These findings necessitate a multi-faceted approach that not only addresses language acquisition but also considers the specific needs arising from hearing impairments, such as providing visual aids, assistive technology, and specialised instruction (see Cawthon, 2001; Kaczorowski et al., 2023).

5.1. Implications for educational psychologists

Given the variability in the magnitude and direction of the achievement gap between EAL students with various disabilities, the findings presented in this study bear significant implications for educational practices. Various researchers have recommended the approach of data-based decision making as an effective method for understanding and supporting this diverse group of individuals (e.g., Lemons et al., 2017; Wilcox et al., 2021). Data-based decision making involves the use of reading, math, and writing assessments and progress monitoring data to evaluate individual students' needs in each academic domain and to assess their response to the supports being provided. This approach ensures that educational strategies are tailored to the specific needs of this diverse group of individuals, promoting more effective evaluation of individual students' educational needs (e.g., Filderman et al., 2018).

Educational psychologists can play a key role in guiding educators in the selection and utilisation of valid and reliable universal screening and progress monitoring instruments. However, educational psychologists supporting educators working with EAL students with SEND would need to possess expertise in a range of pertinent areas, including first and second language acquisition, sociocultural foundations, data-based decision-making for pupils with SEND, and culturally and linguistically responsive assessment, instruction and intervention (Linan-Thompson et al., 2022).

5.2. Implications for educators of EAL with SEND and special education needs coordinators

In addition to data-based decision making, the findings from this study underscore the need for educators to adopt specific evidence-based instructional strategies to effectively support EAL students with SEND. Drawing on recommendations from the Institute of Education Sciences (see Baker et al., 2014), educators should focus on several key areas: teaching a set of academic vocabulary words intensively over several days using various instructional activities, integrating oral and written English language instruction into content-area teaching, and providing regular, structured opportunities to develop written language skills. By selecting engaging texts that include academic vocabulary and teaching these words in depth through multiple modalities, students can develop a stronger grasp of essential terms (Barth et al., 2021; Beck et al., 2013; Daniel, Barth, & Ankrum, 2024; Proctor et al., 2020). Integrating language instruction into content-area teaching and providing opportunities for students to discuss and write about content in pairs or small groups can ensure that language development occurs within meaningful academic contexts (Miller, 2016). Additionally, structured writing opportunities that are anchored in content and focused on developing academic language and writing proficiency are crucial (Baker et al., 2014). Furthermore, Vaughn and colleagues (2023) recommend that educators actively enhance their knowledge of students' cultural backgrounds by engaging with literature and resources that explore the histories and experiences of diverse cultural groups. Creating a classroom environment that reflects positive images of various cultures—through displays, literature, and educational materials—can promote inclusivity and respect (Vaughn et al., 2023).

In the context of mathematics instruction for EAL students with SEND, it is crucial to design and deliver systematic and explicit instruction that addresses both language and mathematical concepts (see Kong et al., 2023; Powell & Fuchs, 2018). This approach minimises confusion and builds foundational knowledge, essential for handling complex problems. Moreover, providing frequent opportunities for students to verbalise their mathematical thinking in English can significantly enhance their conceptual understanding and language proficiency (see Doabler et al., 2016). Implementing these evidence-based practices can help bridge the achievement gap and promote the academic success of EAL students with SEND.

5.3. Implications for educational policy

The findings of this study underscore the need for educational policies that acknowledge and address the complex interplay between EAL status and various SEND categories. There is a need for policymakers to prioritise the allocation of resources to support the development and implementation of evidence-based interventions that are tailored to the specific needs of a diverse group of EAL learners. This includes funding for professional development programs that equip educators with the knowledge and skills necessary to effectively support EAL students with SEND (Fagan & Herrera, 2022). Additionally, there is a need for policies to promote the use of valid and reliable assessment tools that are culturally and linguistically responsive, ensuring accurate identification of student needs and appropriate allocation of resources. This is important as a recent study in the UK reported that a significant majority of assessors assess EAL pupils only in English, rather than their first language (Daniel, Clucas, & Wang, 2024). Importantly, supporting EAL learners with SEND requires the use of data-based decision-making to accurately identify and address their specific academic needs. Policymakers need to ensure that educators receive ongoing professional development and access to necessary resources to effectively understand and interpret progress monitoring data. This will enable teachers to design and implement targeted interventions that provide the most appropriate support for each student's unique learning needs.

6. Limitations

This study has several limitations that must be acknowledged. Past researchers have argued that the classification of EAL is not a precise measure of language proficiency (Demie, 2018; Strand et al., 2015). Pupils recorded as EAL may range from those who speak no English at all to those who are fully fluent in English. This variability can significantly impact the interpretation of findings related to EAL status and its association on academic outcomes. The lack of granularity in EAL classification may obscure the true extent of language proficiency and its effects on learning, leading to potential overgeneralisations or misinterpretations of the data. Another limitation of this study is the absence of data on students' race and ethnicity, which precluded analysis of how cultural backgrounds may be associated the educational outcomes of EAL students with SEND.

Additionally, the study relies on administrative data that may not capture the full complexity of students' language experiences and proficiencies. Factors such as the age of arrival in the country, prior educational experiences, and the quality of English language instruction received are not accounted for, which can predict academic performance and outcomes. Moreover, the study's focus on EAL and SEND status as categorical variables does not consider the dynamic and multifaceted nature of language acquisition and learning difficulties. The interaction between these factors is complex and may not be fully captured by the categorisations used in this study. Future research should aim to incorporate more direct measures of language proficiency and severity of learning needs to provide a clearer understanding of how these factors interact and affect educational outcomes.

Disclosure statement

The author reports there are no competing interests to declare. This work was undertaken in the Office for National Statistics (ONS) Secure Research Service using data from ONS and other owners and does not imply the endorsement of the ONS or other data owners.

Data availability

Data are available by requests from the Office of National Statistics in England, Department of Education, released March 30, 2023, ONS Secure Research Service, dataset, Bespoke National Pupil Database extract.

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Appendix A

Table A1
Correlation Between Year 2 and Year 6 National Assessments

Full Sample	Year 6 Read	Year 6 Write	Year 6 Math	Year 2 Read	Year 2 Math	Year 2 Write
Year 6 Read	1.00					
Year 6 Write	0.76	1.00				
Year 6 Math	0.69	0.76	1.00			
Year 2 Read	0.65	0.68	0.58	1.00		
Year 2 Math	0.61	0.68	0.58	0.82	1.00	
Year 2 Write	0.59	0.62	0.68	0.76	0.74	1.00

All p-values <0.01

Appendix B

Table B1
Correlation Between Year 2 and Year 6 National Assessments for English as Additional Language Learners.

EAL Learners	Year 6 Read	Year 6 Write	Year 6 Math	Year 2 Read	Year 2 Math	Year 2 Write
Year 6 Read	1.00					
Year 6 Write	0.77	1.00				
Year 6 Math	0.70	0.77	1.00			
Year 2 Read	0.62	0.67	0.57	1.00		
Year 2 Math	0.60	0.66	0.56	0.85	1.00	
Year 2 Write	0.59	0.63	0.67	0.78	0.77	1.00

All p-values <0.01. EAL = English as an additional language.

Appendix C

Table C1
Correlation Between Year 2 and Year 6 National Assessments for English as First Language Learners

NonEAL Learners	Year 6 Read	Year 6 Write	Year 6 Math	Year 2 Read	Year 2 Math	Year 2 Write
Year 6 Read	1.00					
Year 6 Write	0.76	1.00				
Year 6 Math	0.69	0.76	1.00			
Year 2 Read	0.65	0.71	0.59	1.00		
Year 2 Math	0.61	0.69	0.59	0.82	1.00	
Year 2 Write	0.59	0.63	0.69	0.75	0.73	1.00

All p-values <0.01. NonEL = English as first language learners.

Appendix D

Table D1
Multi-level Model Estimates for the Effects of Gender, EAL, and all SEND Categories.

	Model 1			Model 2			Model 3		
Effects	Reading	Math	Writing	Reading	Math	Writing	Reading	Math	Writing
Fixed Effects									
Intercept	105.90	104.08	106.93	82.24	80.33	83.98	82.24	80.34	83.98
Male	−1.20	1.06	−1.40	−0.35	0.58	0.07	−0.35	0.58	0.07
EAL	−1.44	0.86	1.02	0.55	2.11	2.64	0.57	2.08	2.65
ASD	−3.96	−4.61	−3.65	−1.26	−1.69	−0.12	−1.15	−1.72	−0.11
HI	−4.57	−3.96	−4.08	−1.43	−1.04	−0.88	−1.25	−0.97	−0.74
ID (Moderate)	−10.64	−10.06	−11.34	−3.27	−3.39	−4.18	−3.26	−3.41	−4.18
ID (Severe)	−12.40	−12.46	−13.48	−3.32	−3.38	−3.91	−3.22	−3.44	−3.86
ID (Profound)	−11.72	−12.44	−12.22	−3.25	−4.08	−3.21	−3.42	−4.32	−2.84
MSI	−3.45	−5.00	−4.97	−0.72	−1.92	−1.40	−0.48	−1.77	−1.14
NSA	−8.16	−7.59	−9.06	−2.92	−2.78	−3.96	−3.00	−2.87	−4.02
PD	−3.71	−5.11	−4.57	−0.91	−1.88	−1.00	−0.81	−1.85	−0.90
Other	−6.70	−6.92	−7.67	−1.94	−2.41	−2.69	−1.93	−2.44	−2.65
SEMH	−4.49	−4.84	−5.38	−1.90	−2.25	−2.44	−1.92	−2.28	−2.45
SLCN	−9.30	−8.20	−9.38	−2.89	−2.35	−2.97	−2.90	−2.47	−3.03
SPLD	−8.24	−7.67	−10.17	−1.90	−2.51	−4.03	−1.87	−2.51	−4.02
VI	−3.43	−3.68	−4.65	−0.40	−1.03	−1.56	−0.35	−1.07	−1.45
Year 2 Read				1.34			1.34		
Year 2 Math					1.41			1.41	
Year 2 Writing						1.40			1.40
ASD x EAL							−1.22	0.34	−0.09†
HI x EAL							−0.85	−0.31	−0.68
ID (Moderate) x EAL							−0.04†	0.14†	−0.002†
ID (Severe) x EAL							−0.56†	0.38†	−0.29†
ID (Profound) x EAL							0.93†	1.39†	−1.99†
MSI x EAL							−2.55	−1.50	−2.58
NSA x EAL							0.42†	0.48†	0.34†
PD x EAL							−0.78	−0.26†	−0.77
Other x EAL							−0.10†	0.28†	−0.30
SEMH x EAL							0.24†	0.31	0.05†
SLCN x EAL							0.009†	0.45	0.21
SpLD x EAL							−0.36	−0.01†	−0.13†
VI x EAL							−0.28†	0.20†	−0.61†
Random Effects									
School	3.93	6.20	5.56	1.84	3.63	2.77	1.84	3.62	2.77
Residual	57.07	44.27	50.50	36.48	25.46	29.48	36.48	25.46	29.48

†values $p > .01$; not significant. ASD = Autism spectrum disorder; HI = Hearing impairment; ID = Moderate, Severe and Profound intellectual disabilities; MSI = Multi-sensory impairments; NSA = No specialist assessment; PD = Physical disabilities; SEMH = Socio-emotional mental health needs; SLCN = Speech, language, and communication needs; SpLD = Specific learning difficulties/disabilities; VI = Visual impairments; SEND = Special educational needs and disabilities; EAL = English as an additional language learner. SEND comparison group is non-SEND pupils.

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