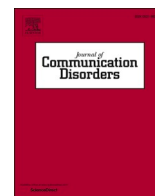


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Journal of Communication Disorders

journal homepage: www.elsevier.com/locate/jcomdis

Age of onset, motivation, and anxiety as predictors of grammar and vocabulary outcomes in English as a foreign language learners with developmental language disorder

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ARTICLE INFO

Keywords:

English as a foreign language
 Developmental language disorder
 Age of onset
 Motivation
 Anxiety

ABSTRACT

Introduction: Like children with typical language development, their peers with developmental language disorder (DLD) are expected to learn English as a foreign language (EFL). For pupils without DLD, it is well-established that amount of informal exposure to English outside of the classroom, starting age of EFL instruction and motivation are strong positive predictors of EFL learning rate and/or achievement, whereas anxiety is negatively related to performance. This paper is the first attempt to investigate how these predictors of EFL performance operate in learners with DLD.

Methods: Participants were nineteen Dutch-speaking 7th graders with DLD learning English as a school subject at a specialist education facility in the Netherlands. English receptive grammar and receptive vocabulary were measured twice, with a four-month interval. Foreign language learning motivation, anxiety and (length and amount of) informal exposure to and instruction in English were measured via questionnaires.

Results: The participants did not show any progress on English vocabulary and grammar. At Time 1, vocabulary and grammar scores were positively related to starting age of EFL instruction and negatively related to anxiety. For vocabulary, achievement was also positively predicted by attitudes towards English lessons. Only the relationship between starting age of instruction and vocabulary outcomes was visible at Time 2. Amount and length of informal exposure to English did not predict performance, which is in stark contrast to the patterns observed in EFL learners with typical language development.

Conclusions: We conclude that children with DLD benefit from a later onset of foreign language lessons, whereas length and amount of out-of-school exposure to English are less important in the context of DLD, possibly due to difficulty with implicit learning.

1. Introduction

While language learning or acquisition is expected to proceed without serious issues for the majority of children, this is not the case for those children with developmental language disorder (DLD), a language learning difficulty affecting 7–8% of children (Bishop, 2010). The disorder is characterized by the presence of language shortfalls that cannot be explained by intellectual disabilities, hearing impairments, neurological conditions, or a lack of linguistic input (Leonard, 2014). While these shortfalls can become visible in all

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<https://doi.org/10.1016/j.jcomdis.2024.106407>

Received 5 June 2023; Received in revised form 11 January 2024; Accepted 19 January 2024

Available online 21 January 2024

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linguistic domains, morphosyntax and phonology tend to be affected most severely (Leonard, 2014). As a consequence, auxiliaries, copula's, and inflectional morphology tend to be omitted (Leonard, 2014). In addition, sentences that include, for instance, embedding are subject to production (e.g., Fletcher, 2008) and processing (e.g., Adams, 1990) errors. Similarly, phonology tends to be characterized by a small inventory of phonemes, and the frequent and persistent occurrence of simplifications (Aguilar-Mediavilla et al., 2002). This being said, DLD is not only associated with challenges in the linguistic domain. For instance, it has been suggested that language learners with the disorder may experience difficulty processing both linguistic and non-linguistic information, with reaction times being slower, and interference control and visuospatial working memory functioning less well in learners with DLD (Blom & Boerma, 2020; Zapparrata et al., 2023). Moreover, according to Ullman and Pierpont (2005), DLD is associated with procedural learning deficits. Procedural learning constitutes the learning of motor or cognitive skills including sequences, like cycling. It tends to result in implicit knowledge since it does not involve conscious effort (Ullman & Pierpont, 2005). Similar learning may allow for the acquisition of linguistic rules, like regular morphology and syntax, which are compromised in learners with DLD (Ullman & Pierpont, 2005). Word learning and the acquisition of irregular morphosyntax, on the other hand, tend to pose less difficulty for learners with DLD and proceed through declarative learning (Ullman & Pierpont, 2005). This type of knowledge tends to be conscious or explicit. Research on speech and language therapy appears to corroborate the notion that declarative memory is intact in learners with DLD, as explicit, metalinguistic interventions have shown to be beneficial (see reviews in Balthazar et al., 2020; Ebbels, 2014; Frizelle et al., 2021).

Research on DLD has largely focused on first (L1) and naturalistic second (L2) language acquisition (e.g., acquiring English in an English-speaking country) (Paradis et al., 2021). In contrast, very little is known about foreign language learning in children with DLD in school settings, where exposure to the target language is limited. The distinction between second and foreign language acquisition is particularly important in light of the procedural learning deficits associated with the disorder. Children with DLD need more input than typically-developing peers (Tomblin et al., 2007). Therefore, in school settings, the negative effects of the disorder are likely to be aggravated by the limited classroom time devoted to foreign languages. Thus far, only six published studies have addressed English as a foreign language (EFL) learning by children with DLD (Stolvoort et al., 2023; Tribushinina et al., 2020, 2022, 2023a, 2023b; Zoutenbier & Zwitterlood, 2019). Despite the lack of research on this topic, in countries such as the Netherlands, children with DLD receive English lessons in both primary and secondary school, like children with typical language development (Thijs et al., 2011). Zoutenbier and Zwitterlood (2019) assessed EFL receptive vocabulary, and listening and reading comprehension skills of Dutch-speaking EFL learners with DLD in special primary education in the Netherlands and compared their performance to age-related norms. The results showed that language learners with DLD achieve lower scores compared to their peers without DLD (Zoutenbier & Zwitterlood, 2019), even though ample out-of-school exposure to English is available to Dutch children, mainly via media (Unsworth et al., 2015), and this may allow for naturalistic EFL acquisition. These findings align with those presented by Tribushinina et al. (2020), whose study traced the development of EFL vocabulary and grammar in Russian-speaking children with and without DLD over the course of the first two years of EFL instruction. The results of the study suggest that EFL development progresses at a much slower rate for learners with DLD than their peers without DLD.

For pupils without DLD, it is well-established that amount of informal exposure to English outside of the classroom (e.g., Lindgren & Muñoz, 2013), starting age of EFL instruction (e.g., Jaekel et al., 2017) and motivation (e.g., Gardner, 2010) are strong positive predictors of EFL learning rate and/or achievement, whereas anxiety is negatively related to performance (e.g., Ellis, 2004). However, it is unknown how these predictors operate in foreign language learners with DLD. This paper aims to fill this gap and determine whether (and how) EFL performance of Dutch-speaking children with DLD is related to starting age of EFL lessons, onset and amount of out-of-school exposure to English, motivation and anxiety. In the following section, we briefly review the literature on age effects and the role of exposure and motivation in foreign language learning by typically-developing learners. We will then discuss the literature on the role of these predictors in L2 learning by children with DLD. Due to the paucity of research on EFL learning by children with DLD in instructed settings, we will also rely on the indirectly relevant literature on L2 acquisition in naturalistic settings.

2. Predictors of L2 and foreign language achievement in typically-developing learners

2.1. Exposure

For typically-developing EFL learners in Europe, research has shown that out-of-school exposure to English is an important predictor of EFL achievement (Lindgren & Muñoz, 2013; Muñoz et al., 2018; Muñoz & Cadierno, 2021). Leona et al. (2021) report that Dutch learners are often exposed to English via games and media, and this form of exposure is positively associated with vocabulary size. Similarly, Peters (2018) demonstrates that in Belgian (Flemish) learners of English the amount of informal exposure outside of the classroom is a more important predictor of vocabulary outcomes than the amount of formal instruction at school.

2.2. Age effects

In naturalistic settings, it has been shown that learners with earlier exposure to an L2 generally achieve better language outcomes compared to learners with a later L2 onset (Thordardottir & Juliusdottir, 2013), although it has been indicated that a later start can be beneficial to the rate at which L2 vocabulary (Goldberg et al., 2008; Thordardottir, 2020) and grammar (Thordardottir, 2020) develop. However, previous research including learners of varying ages (ranging from 4 to 19 years of age) has shown that the findings obtained in naturalistic settings cannot be straightforwardly generalized to instructed classroom settings, where exposure to the target (foreign) language is limited. Like in naturalistic settings, research on foreign language learning generally reveals that later starters have a

learning rate advantage (e.g., Jaekel et al., 2017; Muñoz, 2006; Navés et al., 2003), which is usually attributed to more developed cognitive (Muñoz, 2006; Tribushinina et al., 2020) and (meta)linguistic skills (Cummins, 1979). However, unlike in naturalistic L2 acquisition, younger foreign language learners do not achieve better language outcomes than older peers, and hence do not have an *ultimate attainment advantage* (e.g., Goriot, 2019; Muñoz, 2006; Pfenninger, 2014), presumably because the amount of language input in foreign-language classrooms is too limited to benefit from implicit learning advantages of younger children (Muñoz, 2006). More specifically, Pfenninger (2014) found that an early start of EFL instruction (i.e. in primary school versus secondary school) does not lead to higher proficiency levels in vocabulary and grammar. Similar results have been reported by Goriot (2019), who found that the perception of English phonemes in Dutch primary-school pupils was not affected by their age of initial instruction (four compared to 11 years of age). A longitudinal study reported by Jaekel et al. (2017) revealed that starting EFL instruction between six and seven years of age was associated with an advantage compared to a starting age of eight or nine years at the initial stages of EFL learning. However, after two years, learners with a later age of instruction (between the ages of eight and nine years) were able to catch up and even outperformed their peers with an earlier age of instruction on listening and reading comprehension, despite the latter group having received a greater amount of instruction over time. A similarly variable effect of time was found by Pfenninger and Singleton (2016): A negative relationship between age of instruction and EFL vocabulary disappeared over a time span of five years, whereas a positive relationship between age of instruction and EFL grammar became stronger with time.

2.3. Motivation and anxiety

In addition to the individual differences related to age of onset, motivation has also been shown to be a strong predictor of EFL proficiency in typically-developing learners. It predicts foreign language success, continuity, and eagerness in learners and is tightly linked to attitudes towards foreign language learning (Gardner, 2010). For instance, greater motivation is associated with better achievement in terms of writing, listening, and reading (Kiss & Nikolov, 2005), as well as vocabulary and grammar outcomes (Sanz, 2000). However, other studies report mixed findings on the involvement of motivation in EFL achievement (Muñoz & Tragant, 2001), which might be related to differences between studies as to what language skills are measured and how motivation is operationalized. For example, Pfenninger and Singleton (2016) report that motivation was positively related to EFL vocabulary and grammar outcomes when it was conceptualized as attitudes towards English lessons, but no strong relation with outcomes was found when motivation was defined as attitudes towards learning English in general.

Another affective factor that has proved relevant to EFL outcomes of typically-developing learners is the experience of anxiety in the EFL classroom, regardless of learners' personal traits (Ellis, 2004). Previous research has repeatedly revealed a negative association between anxiety and various foreign language skills (Clément et al., 1994; Leona et al., 2021; Pyun et al., 2014). Ellis (2004) notes that anxiety might be greater in learners with processing deficits, which could result in lower EFL achievement. However, it is unclear in which direction the relations operate, as anxiety may be caused by EFL performance and EFL performance may be shaped by anxiety (Ellis, 2004).

3. Predictors of L2 and foreign language achievement in learners with DLD

As explained above, much of the previous research has focused on bilinguals rather than foreign language learners with DLD. Therefore, in this section we will also draw on (indirectly) relevant studies investigating predictors of L2 learning success in naturalistic settings.

3.1. Exposure

With respect to exposure, according to Evans et al. (2009), similar amounts of L2 exposure lead to different achievement in bilingual learners with and without DLD, in favour of the latter group. Because children with DLD have difficulty transforming input into uptake (e.g., Blom & Boerma, 2020; Zapparrata et al., 2023), the effects of the disorder are sometimes similar to the effects of reduced exposure as observed in heritage bilinguals (Tribushinina et al., 2018). Similarly, research has shown that the relationships between amount and richness of exposure and L2 vocabulary and grammar outcomes are much weaker in children with DLD than in peers with typical language development (Blom & Paradis, 2015; Govindarajan & Paradis, 2019; Smolander et al., 2021). Various reasons for these findings have been presented, ranging from processing shortfalls (Leonard, 2014) to problems in procedural learning (Ullman & Pierpont, 2005).

It is not clear whether and how amount of out-of-school exposure to English in limited-input classroom settings affects EFL learning success in pupils with DLD, since only one study has so far targeted the role of out-of-school exposure in foreign language learning by children with DLD. Tribushinina et al. (2020) report that Russian-speaking pupils with DLD have less out-of-school exposure to English than their peers with typical language development, possibly because parents try to "protect" children with DLD from the extra burden of learning an additional language. This being said, amount of out-of-school exposure was a significant predictor of EFL outcomes: Pupils with more exposure to English outside of the classroom performed better. The present study will continue this line of research and study the relationship between amount of out-of-school exposure to English and EFL skills of Dutch-speaking pupils with DLD in a limited-input (classroom) setting.

3.2. Age effects

Mixed results have been found with respect to effects of the age of exposure in L2 learners with DLD. According to Smolander et al.'s (2021) research, 3–7-year-old sequential bilinguals with DLD who differed in terms of their age of exposure performed similarly on both expressive and receptive vocabulary tasks in the L2, suggesting little influence of a starting age. As against this, several studies found positive effects of a later start on the acquisition of L2 vocabulary, grammar and narrative skills in children with DLD, and these effects appear stronger than in typically-developing L2 learners (Blom & Paradis, 2015; Govindarajan & Paradis, 2019; Paradis et al., 2017). In Blom and Paradis's (2015) study, a later start was associated with greater accuracy in the production of verb morphology, and this effect was stronger for learners with DLD than their peers without DLD, which the authors attribute to the fact that the more developed cognitive skills of older children can be used to compensate for the processing deficits associated with DLD.

Research on age effects in foreign language pupils with DLD in classroom settings is scarce and the current findings are controversial. Tribushinina et al. (2020) traced the development of EFL vocabulary and grammar in Russian-speaking pupils who had begun learning English either in grade 2 or in grade 3. EFL receptive vocabulary and grammar were measured after one, one-and-a-half and two years of English lessons. Even though the groups were matched on the amount of instruction, a later age of instruction was associated with larger receptive vocabularies in English, and this effect was stronger for learners who had less out-of-school exposure to English. At the same time, no differences were observed on the receptive grammar task. In contrast, in Tribushinina et al. (2023a), no effects of age of instruction were found. In their study, Russian EFL learners with DLD completed a receptive vocabulary test after four years of instruction. No differences were found between older pupils who had started learning English in grade 6 and younger pupils who had started learning English in grade 2. The results of these two studies (Tribushinina et al., 2020, 2023a) taken together suggest that the relationship between age of instruction and performance may abate with time. As Muñoz (2006) notes, age of instruction affects language learners in puberty less than younger language learners, since cognitive skills in both early and late starters in puberty are comparable. This may not be the case for younger learners in primary school.

More developed cognitive skills is not the only explanation that has been posited to explain the learning rate advantage of older starters. For instance, according to Cummins' (1979) Linguistic Interdependence Hypothesis, language learners can make use of their L1 knowledge when they learn an additional language. Therefore, older language learners, whose L1 tends to be better developed, can transfer larger amounts of valuable linguistic knowledge to the target language. Moreover, it has been suggested that later starters in instructional contexts can make more use of declarative memory (Tribushinina et al., 2020). Lum et al. (2014) argue that, although language learners with DLD show problems in procedural/implicit learning, differences in procedural memory between learners with and without DLD decrease over time. Declarative memory, which is presumably intact in children with DLD and improves with age, is likely to be used to bypass these problems (Lum et al., 2012), which could be especially helpful in instructional contexts. This may also give older learners an additional advantage because older children tend to be taught languages in a more explicit manner (Tribushinina et al., 2020).

Given the paucity of research on the workings of age effects in foreign language learners with DLD and the controversial findings reported thus far, more research into the role of age of out-of-school exposure and age of formal EFL instruction is clearly warranted. The present study will investigate the relationship between onset of out-of-school exposure to and formal instruction in English in a sample of Dutch-speaking secondary-school pupils with DLD. The Dutch context appears particularly informative in this respect, since Dutch primary schools are free to decide in what grade they introduce English lessons and there is a lot of variability in out-of-school exposure to English (Leona et al., 2021).

3.3. Motivation and anxiety

It is not yet known what role motivation and anxiety play in foreign language learning by children with DLD, since, to the best of our knowledge, there are no studies investigating motivation and anxiety in foreign language learning by learners with DLD.

However, previous research on foreign language learning by learners with language learning difficulties has indicated that attitudes towards foreign language learning may but do not always need to be predictive of language outcomes. In Sparks et al.'s (1993) study, learners were categorized as at low or high risk for foreign language learning difficulties based on foreign language achievement, or as having learning difficulties. When high risk learners and learners with learning difficulties were compared, no significant differences in foreign language attitudes were observed. On the other hand, significant differences in attitudes were found between low and high risk learners. Moreover, research on motivation and anxiety in language learners with dyslexia has shown that self-images form a significant predictor of the effort that learners want to put into foreign language learning, with more positive self-perceptions being associated with more effort (Kormos & Csizér, 2010). On the other hand, it has been found that attitudes towards EFL learning do not predict learners' investment of effort (Kormos & Csizér, 2010). Similarly, Torppa et al. (2022) found that motivation was not related to reading comprehension in the majority language for learners with dyslexia. According to Dörnyei (2005), however, motivational factors might be particularly strong in learners whose "language aptitude and learning conditions" are problematic (p. 65). Contrary to the results found in previous research, this suggests that language learning success of pupils with DLD might be particularly contingent on motivation and anxiety.

3.4. The present study

For typically-developing learners, it is known which factors (e.g., age of onset, motivation, anxiety) predict EFL learning in limited-input (classroom) settings. However, very little is known about how these factors operate in EFL learners with DLD since most of the

available literature focuses on L2 development in learners with DLD in naturalistic settings. The present study aims to determine which of the predictors established for typically-developing pupils also predict foreign language outcomes in Dutch-speaking pupils with DLD in special education.

In regular primary education in the Netherlands (grade 1–6), English lessons are usually taught in an implicit manner, whereas explicit teaching approaches are more common in secondary schools (grade 7 and onwards). This being said, *special* education schools at the secondary level (more specifically cluster-2 schools for children with language and communication disorders) also tend to use teaching materials from the primary-school level in their English lessons. These teaching approaches are largely implicit and skill-based. Moreover, even though Dutch EFL learners in special (primary and secondary) education differ from their typically-developing peers, educational institutions use materials and approaches designed for (primary-school) learners with typical language development, due to the lack of foreign language teaching methods tailored to the specific needs of children with learning disabilities. Therefore, learners with DLD in both primary and secondary school receive mainly implicit EFL instruction that does not involve explanation of grammar rules and metalinguistic awareness raising activities. This means that, generally speaking, they have to extract grammatical rules and vocabulary from implicit input within limited instruction time (30–90 min a week), which does not seem optimal in view of the procedural learning deficits associated with DLD (Ullman & Pierpoint, 2005).

In addition, Dutch primary schools are obliged to offer English lessons to pupils in both special and regular primary education in grade 5 at the latest, but they are allowed to start offering EFL instruction in any of the lower grades (Thijs et al., 2011). However, these circumstances result in differences in length of instruction between pupils when they enter secondary education. By that time, some children have had two years of English lessons, whereas others may have had up to eight years of EFL instruction. This provides research with a unique window on the workings of age effects in EFL learners with DLD.

The current paper presents a longitudinal study in which EFL achievement of Dutch learners in grade 7 of special education (first year of secondary school) is investigated over a time span of four months. These learners came from different primary schools and thus had differing ages of EFL instruction onset. This study aims to give insight into the development of EFL skills during a business-as-usual curriculum, the relationship between age of instruction/exposure and language outcomes, and the role of motivation and anxiety in EFL achievement. The following research questions were addressed:

1. Do Dutch EFL learners with DLD show improvement in grammar and vocabulary when they are exposed to a business-as-usual curriculum?

Since the processing and structuring of linguistic input is problematic in learners with DLD (Leonard, 2014; Ullman & Pierpoint, 2005), it is likely that they show little improvement in grammar and vocabulary during a business-as-usual curriculum, which is largely implicit.

2. Do age of exposure and/or age of instruction predict grammar and vocabulary outcomes in EFL learners with DLD?

If the results obtained in Tribushinina et al. (2020) for Russian-speaking primary-school pupils with DLD can be extrapolated to the instructed Dutch EFL context with slightly older learners, it can be hypothesized that there is a positive relationship between vocabulary achievement and age of instruction. However, this may not be the case for grammar. On the other hand, if the results obtained in naturalistic L2 acquisition (Blom & Paradis, 2015; Govindarajan & Paradis, 2019; Paradis et al., 2017) can be generalized to EFL learning in limited-input (classroom) settings, it can be hypothesized that grammar achievement is predicted by age of exposure, while this is may not be the case for vocabulary (Smolander et al., 2021).

3. Do motivation and anxiety predict grammar and vocabulary outcomes in EFL learners with DLD?

Studies on the role of motivation in EFL achievement have revealed a relationship between this factor and EFL grammar and vocabulary in typically-developing pupils (Pfenninger & Singleton, 2016; Sanz, 2000). Dörnyei (2005) suggests that such factors are especially important to lower-aptitude learners. Therefore, it can be hypothesized that attitudes towards English lessons and EFL learning are positively related to EFL achievement in pupils with DLD. With respect to anxiety, research has indicated that this affective factor is negatively related to (E)FL achievement in typically-developing learners (Clément et al., 1994; Ellis, 2004; Pyun et al., 2014). In addition, anxiety might be negatively related to motivation (Ellis, 2004) and the latter may be strongly related to EFL outcomes in language learners who experience difficulty acquiring or learning a language (Dörnyei, 2005). Therefore, we predict that anxiety is negatively related to EFL achievement in learners with DLD.

4. Do the abovementioned potential relationships change over time?

It has been shown that, in typically-developing pupils, the relationship between age of instruction and vocabulary abates with time, while the relationship between age of instruction and grammar becomes more visible over time (Pfenninger & Singleton, 2016). Similarly, there is evidence that relationships between motivation and EFL skills become more prevalent over time (Pfenninger & Singleton, 2016). Therefore, we expect that the relationships between the studied predictors and EFL performance change over time.

4. Methodology

This research was approved by the Ethics Assessment Committee of the Faculty of Humanities at Utrecht University.

4.1. Participants

The present study was conducted at a special secondary school in the Netherlands, a so-called cluster-2 school for pupils with language disorders and hearing impairments. Nineteen pupils with DLD from five classes participated. One participant was removed from the analyses since they had not completed the tests, resulting in a total of 18 participants (2 assigned female at birth, 16 assigned male at birth). Participants had been independently diagnosed with the disorder, in accordance with the standardized protocol of Siméa (2014). According to this protocol, DLD is diagnosed if an overall score of 2 SD or more below the age-appropriate norm is obtained on a standardized language test in Dutch. In addition, DLD can be diagnosed if scores obtained on no fewer than two of the four subscales in said test are 1.5 SD or more below age-appropriate norms. Exclusion criteria for the diagnosis include the presence of hearing impairments and intellectual disabilities.

The participants were between 12;0 and 13;7 years old (mean age: 12;9), and were in 7th grade, which is a transition year from primary to secondary education. Five pupils were raised monolingually (in Dutch) and 13 pupils were raised multilingually.¹ Home languages of the multilingual pupils included Kurdish ($n = 2$), Arabic ($n = 4$), Chinese ($n = 1$), Berber ($n = 3$), Spanish ($n = 1$), Persian ($n = 1$), and Turkish ($n = 3$). Pupils had first been exposed to English when they were between 1 and 10 years old ($M = 6;06$) (hereafter: age of exposure). There is much variability in the age at which Dutch pupils first receive EFL instruction and some primary schools do not offer EFL instruction to their pupils even though they are obliged to do so. As a result, the participants had started receiving English lessons between 2nd and 7th grade ($Md = 4$) (hereafter: age of instruction), meaning that several participants had first received EFL instruction in the first year of secondary school.

4. Materials

4.1. Grammar test

Receptive grammar was measured by using the *Test for Reception of Grammar* (TROG-2) (Bishop, 2003). On each trial, the participants were presented with four pictures and heard an English sentence. The test consisted of a total of 80 sentences divided over 20 four-item blocks that each targeted a different grammatical phenomenon (e.g., negation, relative clauses), and also included one practice item.

TROG is a standardized test for English-speaking children, and it is administered individually by means of a booklet. Moreover, it includes a breaking rule: The test is discontinued if learners fail on five blocks. However, since this study was executed with classroom learners of English, the procedure was adapted.² The test was administered plenary by using PowerPoint. Each participant received an answer sheet and the participants were told that they would hear English sentences accompanied by four pictures. For each sentence, they were asked to circle the number of the picture that matched the produced sentence. Prior to the start of the test, they were allowed to ask questions. Then, the participants saw 81 slides (1 practice trial and 80 test trials). Each sentence was produced by the regular teacher or researcher and sentences were not repeated unless background noise had made the sentences inaudible. In addition, moving back and forward between slides was not allowed. After 40 test items, the participants took a short break. Participants could receive a total of 80 points, one point for each correct answer.

4.2. Vocabulary test

Receptive vocabulary was measured by using a translation task. The participants were visually and auditorily presented with 40 English words (*meat, proud, jealous, cloud, beach, deep, count, sneeze, after, blanket, sharp, brush, light, above, curtain, cost, ready, empty, train, swim, angry, climb, toe, belt, rich, shout, sing, clean, tower, medal, healthy, sand, taste, share, loud, sheep, button, yawn, honey, shadow*), of which 20 words were non-cognates and 20 words were English–Dutch cognates. The cognates and non-cognates were matched for frequency and word-length in English and Dutch. The test included 3 practice trials.

The test was administered plenary by using PowerPoint. Each participant received an answer sheet and the participants were told that they would hear and see English words. The participants were asked to write down the translation in Dutch. However, in light of the word-retrieval deficits in children with DLD (McGregor, 1997), they were also allowed to give a description of the concepts. If an

¹ We are aware that multilingualism complicates diagnosing DLD. Since standardized tools used in speech and language therapy tend to be based on monolingual norms and multilingual learners tend to be exposed to the majority language on a less frequent basis, lower performance levels may be the result of a lack of exposure rather than DLD. We did not have access to Dutch or L1 measures to explore this possibility. However, DLD tends to be diagnosed before or during primary education, allowing for relatively large amounts of speech and language therapy prior to the start of secondary education. Only learners with more persistent forms of DLD are enrolled in specialist secondary education in the Netherlands.

² Although the adjustment of the test has consequences for extrapolation, the grammar test used in the current study was standardized for children for whom English is their native language. As a consequence, scores obtained in this study cannot be compared to scores obtained by the populations for which the test was designed.

appropriate translation or description was given, answers were registered as correct. These included *toren* ('tower') and *zo'n gebouw met veel verdiepingen* ('a building with many stories') for *tower*. Participants could receive a total of 40 points, one point for each correct answer.

4.3. Motivation and anxiety

We created a questionnaire based on Piggott's (2019) Dutch version of the *Attitude and Motivation Test Battery* (AMTB) created by Gardner (2010). It was altered in length to adapt to the deficits associated with DLD, and consisted of 15 statements and 4-point Likert scales ranging from 'totally disagree' to 'totally agree'. However, after administration, 3 statements were removed to increase reliability. This resulted in 5 statements about attitudes towards learning English ($\alpha = 0.771$) such as 'I enjoy learning English' (hereafter: attitude), 4 statements about attitudes towards the EFL lessons (hereafter: course evaluation) ($\alpha = 0.734$) such as 'I always look forward to the English lessons', and 3 statements about EFL anxiety ($\alpha = 0.738$) such as 'I feel comfortable speaking English'. Responses to the positively formulated Likert scales about attitude and course evaluation were represented by numerical values, ranging from 1 ('totally disagree') to 4 ('totally agree'). For negatively formulated statements, the numbers were reversed. A similar procedure was adopted for the statements about anxiety. However, the remaining items were all formulated in a positive manner and the number of points was reversed, meaning that 'totally agree' was represented by the numerical value 1 and 'totally disagree' was represented by the numerical value 4. Therefore, a higher anxiety score indicates more anxiety.

4.4. Exposure to English and length of instruction

Amount of out-of-school exposure to English, and age of instruction and exposure were measured by means of a questionnaire. With respect to out-of-school exposure, in a total of 8 multiple-choice questions, the participants were asked to give an indication of the frequency (4 questions) and duration (4 questions) of their out-of-school exposure to English. Questions were divided into categories based on activity-type (watching videos/films, listening to music, reading texts, and playing games). For the questions about frequency, a maximum of 16 points could be obtained. The maximum score for the questions about duration was 12, resulting in a maximum of 28 points. With regard to age of exposure, participants were asked to indicate at which age they had first encountered English on a regular basis. Age of instruction was measured by asking participants in which grade of primary school they had first received English instruction. If participants' answers were mixed ('9 or 10 years old' or 'Grade 5 or 6'), the most conservative answer (i. e. the shortest period of time) was included in the analyses. If the answers at each measurement (Time 1 and Time 2) differed, a mean was calculated.

4.5. Procedure

The participants were tested twice, with a four-month interval. The first measurement was in December of their first year at secondary school (grade 7) and the second measurement was in April of the same school year. At both measurements, the participants completed the TROG, the vocabulary task, and questionnaires during their regular English lessons. Instructions were given in Dutch. Each measurement was completed during two sessions. During the first session of each measurement, the TROG was completed, which took approximately 45 min. During the second session of each measurement (approximately 40 min), the vocabulary task and questionnaires were completed. The items in the TROG and vocabulary task were presented to the participants in a plenary manner, but completed individually. Both the presentation and completion of the questionnaires was individual.

During the four-month interval, the participants received English lessons of approximately 50 min twice a week and used course materials produced for and employed in regular primary education. In these materials, music plays a significant role, with English being taught via pop songs. Moreover, songs and exercises are structured according to themes, such as travelling and hobbies. With respect to grammar, a holistic approach is adopted, meaning that learners acquire grammar rules through writing, speaking, and reading exercises. Although a small number of grammar rules are offered to learners in an explicit manner, the majority of the to-be-learned structures are taught implicitly. The same is the case for vocabulary, as translations of words tend to be offered to learners only in the final phase of each chapter, after they have completed exercises in which the words are used.

4.6. Analyses

First, to establish whether a distinction between bilinguals and monolinguals should be made in the analyses, we created models in which Bilingual Status was included as a predictor and both of the English measures were included as outcome variables. The random factors consisted of intercepts for Time, Participant nested in Class (Class:Participant), and Trial (nested in Block for the TROG) (Block: Trial). No significant differences in scores between bi- and monolinguals were detected ($B = 0.55$, $SE = 0.69$, $z = 0.79$, $p = 0.427$ for grammar, $B = 0.56$, $SE = 0.82$, $z = 0.68$, $p = 0.495$ for vocabulary). As a consequence, this variable was not included in any of the further analyses.

To determine whether performance changed over time, we compared performance on the pre- and posttest for both of the English measures. For this, generalized linear mixed effects models were constructed in RStudio (RStudio Team, 2020) by using the *lme4*-package created by Bates et al. (2015). Scores obtained on the TROG and vocabulary task constituted the outcome variable. Time was the predictor. Intercepts for Participant nested in Class (Class:Participant) and Trial (nested in Block for the TROG) (Block: Trial) were included as random factors.

To address our second, third, and fourth research question, generalized linear mixed models were created in RStudio (Rstudio Team, 2020) by using the *lme4*-package (Bates et al., 2015). Scores obtained on the TROG or vocabulary task constituted the outcome variable. When including all affective variables in one model, VIF scores, calculated with the *car*-package (Fox & Weisberg, 2019), were above 20.0, indicating multicollinearity. Therefore, three models were constructed. Each model contained the predictors Age of Exposure and Age of Instruction, and the control variable Out-of-School Exposure. In addition, each model included either Anxiety, Attitude, or Course Evaluation as an additional predictor. The random parts consisted of intercepts for Participant nested in Class (Class:Participant) and, for the vocabulary task, Trial, and, for the TROG, Trial nested in Block (Block:Trial). Separate analyses were run for the TROG and vocabulary task at the pre- and posttest.

5. Results

5.1. Development of grammar and vocabulary

With respect to grammar, the analysis indicated that Time was a significant predictor of scores: $B = -0.26$, $SE = 0.12$, $z = -2.27$, $p = 0.024$. However, Time was not a significant predictor of scores obtained in the vocabulary task: $B = 0.27$, $SE = 0.17$, $z = 1.54$, $p = 0.123$. As can be observed in Table 1, there was a small yet significant decrease in grammar scores, and a rather large yet non-significant increase in vocabulary scores. Therefore, individual differences were inspected.

As can be seen in Fig. 1, for grammar, 9 participants obtained a lower score on the posttest compared to the pretest (mean change: 5.3 points), whereas 2 participants obtained a higher score on the posttest (mean change: 3.5 points). On the vocabulary task, 6 participants obtained a higher score on the posttest compared to the pretest (mean change: 4.2 points), whereas 5 participants obtained a lower score on the posttest (mean change: 1.6 points) (see Fig. 1). These findings suggest that the homogeneity of the change in grammar scores resulted in a significant difference, whereas the heterogeneity of the change in vocabulary scores resulted in a non-significant difference.

5.2. Predictors of grammar outcomes

As can be observed in Table 2, the generalized linear mixed effects models indicated that Age of Instruction significantly predicted scores obtained on the TROG at the pretest (Time 1), with later Age of Instruction being associated with higher scores. In addition, Anxiety was negatively related to outcomes, with less anxiety being associated with higher scores. These relationships are illustrated in Fig. 2. The other variables (Age of Exposure, Out-of-School Exposure, and Attitude and Course Evaluation (both part of motivation)) did not predict grammar outcomes. At the posttest (Time 2), none of the variables significantly predicted scores obtained on the TROG (see Table 3).

5.3. Predictors of vocabulary outcomes

As can be observed in Table 4, the generalized linear mixed effects models indicated that Age of Instruction significantly predicted scores obtained on the vocabulary task at the pretest, with later Age of Instruction being associated with higher scores. Similarly, there was a positive relationship between Course Evaluation and vocabulary outcomes: More positive attitudes towards English lessons were associated with higher scores. On the other hand, the analyses revealed a significant negative relationship between Anxiety and achievement: Greater anxiety predicted lower scores. These relationships are illustrated in Fig. 3. The other variables (Age of Exposure, Out-of-School Exposure, Attitude) did not predict vocabulary outcomes. At the posttest, only Age of Instruction predicted vocabulary scores, with later starters obtaining higher scores (see Table 5).

6. Discussion

This study set out to explore whether and how EFL vocabulary and grammar skills develop over the course of four months in students with DLD attending special secondary education in the Netherlands. At the group level, the results revealed no progress on either of the measures. For grammar, the average score on the posttest was even slightly lower compared to the pretest, which might be due to external circumstances, such as tiredness or school schedule on the testing days. At the individual level, we found that grammar scores improved in 2 (of 16) and vocabulary scores improved in 6 (of 14) of the participants who completed tests at both measurements. Our findings thus indicate that improvement is more likely to occur for vocabulary and that performance on grammar seems more dependent on the testing conditions. This asymmetry appears to be consistent with the idea that grammar is one of the core difficulties in learners with DLD (Leonard, 2014).

The majority of our participants did not show any progress in foreign language proficiency after four months of English lessons (ca.

Table 1
Descriptive statistics.

	Mean score pretest (SD)	Mean score posttest (SD)
Grammar	0.77 (0.42)	0.76 (0.43)
Vocabulary	0.69 (0.46)	0.79 (0.41)

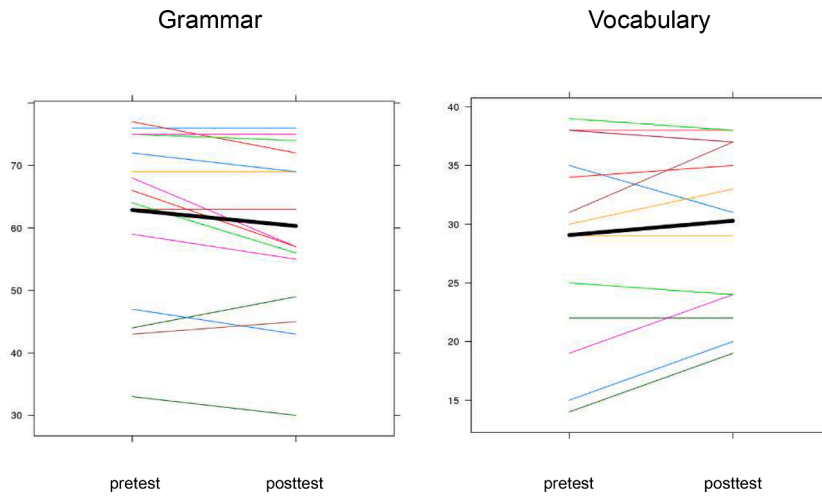


Fig. 1. Cumulative scores per participant per measurement (figure created with Langtest: Mizumoto, 2015). The thick line represents the mean.

Table 2

Model coefficients for the relationships between predictors and scores on the TROG (Time 1).

		Estimate	SE	z value	p value
Attitude	(Intercept)	-2.58	2.01	-1.28	0.199
	Out-of-School Exposure	-0.04	0.07	-0.58	0.563
	Age of Exposure	-0.07	0.23	-0.30	0.767
	Age of Instruction	0.77	0.29	2.61	0.009
	Attitude	0.26	0.55	0.47	0.642
Course Evaluation	(Intercept)	-2.74	1.87	-1.47	0.142
	Out-of-School Exposure	-0.05	0.06	-0.87	0.385
	Age of Exposure	-0.15	0.20	-0.74	0.457
	Age of Instruction	0.75	0.27	2.78	0.006
	Course Evaluation	0.58	0.38	1.51	0.132
Anxiety	(Intercept)	1.54	1.71	0.90	0.367
	Out-of-School Exposure	-0.06	0.04	-1.47	0.141
	Age of Exposure	-0.07	0.13	-0.54	0.589
	Age of Instruction	0.90	0.20	4.47	< 0.001
	Anxiety	-1.70	0.45	-3.77	< 0.001

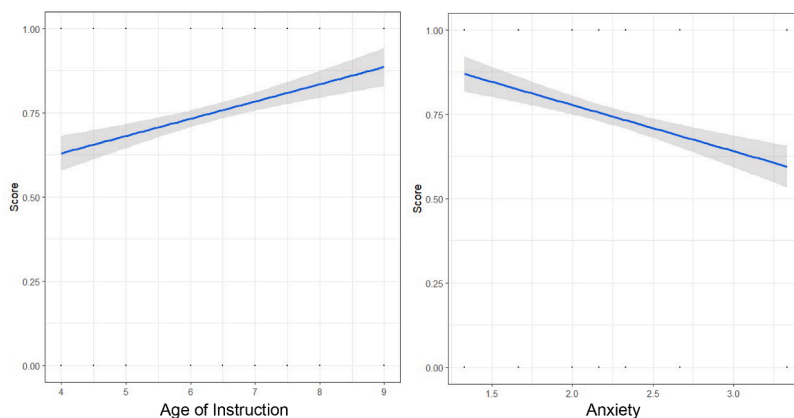


Fig. 2. Relationships between grammar scores and age of instruction and anxiety at the pretest (Time 1).

Table 3
Model coefficients for the relationships between predictors and scores on the TROG (Time 2).

		Estimate	SE	z value	p value
Attitude	(Intercept)	-3.54	2.73	-1.30	0.194
	Out-of-School Exposure	0.05	0.10	0.47	0.640
	Age of Exposure	-0.02	0.19	-0.10	0.923
	Age of Instruction	0.36	0.23	1.56	0.120
	Attitude	0.66	0.68	0.97	0.330
Course Evaluation	(Intercept)	-2.98	3.62	-0.82	0.411
	Out-of-School Exposure	0.06	0.10	0.61	0.542
	Age of Exposure	0.07	0.18	0.41	0.682
	Age of Instruction	0.39	0.25	1.57	0.117
	Course Evaluation	0.14	0.88	0.16	0.874
Anxiety	(Intercept)	-0.08	3.61	-0.02	0.981
	Out-of-School Exposure	0.02	0.10	0.18	0.857
	Age of Exposure	-0.02	0.17	0.09	0.929
	Age of Instruction	0.43	0.24	1.79	0.074
	Anxiety	-0.72	0.74	-0.98	0.330

Table 4
Model coefficients for the relationships between predictors and scores on the vocabulary task (Time 1).

		Estimate	SE	z value	p value
Attitude	(Intercept)	-5.59	2.02	-2.77	0.006
	Out-of-School Exposure	0.03	0.07	0.41	0.683
	Age of Exposure	0.09	0.23	0.39	0.700
	Age of Instruction	0.72	0.29	2.47	0.014
	Attitude	0.51	0.54	0.94	0.345
Course Evaluation	(Intercept)	-5.81	1.83	-3.17	0.002
	Out-of-School Exposure	0.02	0.06	0.39	0.699
	Age of Exposure	0.04	0.19	0.18	0.854
	Age of Instruction	0.72	0.26	2.74	0.006
	Course Evaluation	0.72	0.37	1.97	0.049
Anxiety	(Intercept)	-1.24	1.82	-0.68	0.498
	Out-of-School Exposure	0.02	0.04	0.43	0.668
	Age of Exposure	0.15	0.14	1.07	0.284
	Age of Instruction	0.89	0.22	4.00	< 0.001
	Anxiety	-1.80	0.51	-3.51	< 0.001

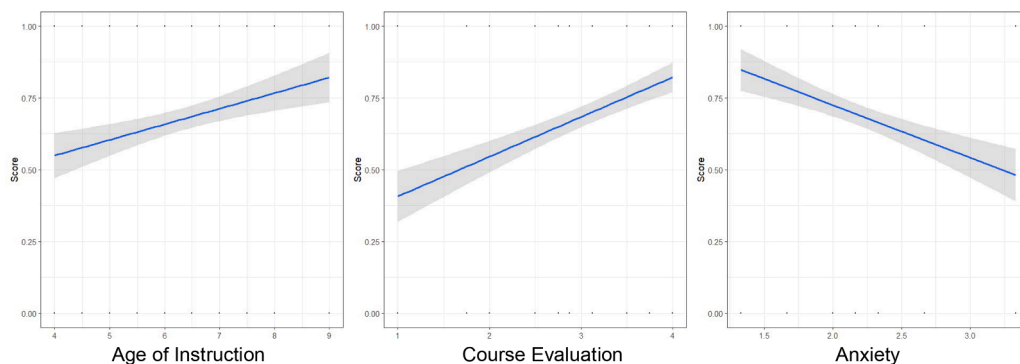


Fig. 3. Relationships between vocabulary scores and age of instruction, course evaluation, and anxiety at the pretest (Time 1).

32 h). Although our study only included a business-as-usual curriculum, there are reasons to assume that the lack of progress was (at least partly) due to the implicit teaching approach, which did not include explicit explanation of grammar rules or cross-language comparisons. These results are in line with the prior findings for primary-school children with DLD, demonstrating that pupils with DLD do not make progress in EFL skills if their English curriculum is implicit and skill-based (Tribushinina et al., 2022, 2023b).

Table 5
Model coefficients for the relationships between predictors and scores on the vocabulary task (Time 2).

		Estimate	SE	z value	p value
Attitude	(Intercept)	-7.24	2.59	-2.80	0.005
	Out-of-School Exposure	0.08	0.09	0.91	0.365
	Age of Exposure	0.12	0.18	0.69	0.492
	Age of Instruction	0.81	0.23	3.57	< 0.001
	Attitude	0.55	0.63	0.86	0.389
Course Evaluation	(Intercept)	-7.86	3.44	-2.28	0.022
	Out-of-School Exposure	0.10	0.09	1.03	0.303
	Age of Exposure	0.18	0.16	1.12	0.261
	Age of Instruction	0.85	0.23	3.64	< 0.001
	Course Evaluation	0.46	0.80	0.58	0.565
Anxiety	(Intercept)	-5.90	3.46	-1.70	0.089
	Out-of-School Exposure	0.09	0.10	0.88	0.382
	Age of Exposure	0.21	0.16	1.27	0.206
	Age of Instruction	0.87	0.23	3.74	< 0.001
	Anxiety	-0.34	0.70	-0.48	0.629

According to Ullman and Pierpont (2005), procedural learning is impaired in children with DLD. This type of learning does not involve conscious effort and does not result in facts or knowledge “available to conscious access”, and hence can be regarded as implicit (Ullman & Pierpont, 2005, p. 401). The deficit is visible in both the linguistic and non-linguistic domain. For instance, in tasks in which participants unconsciously attend to visual patterns, individuals with DLD perform less well than individuals without DLD (Lum et al., 2014). The unconscious discovery of patterns is also involved in more naturalistic forms of language learning, like implicit instruction. This type of instruction does not seem suitable for children with DLD, assuming that the disorder involves difficulty with procedural and hence implicit learning characterized by the detection of language rules in input through inference (Ullman & Pierpont, 2005). In speech and language therapy, there is ample evidence that children with DLD benefit from explicit interventions raising metalinguistic awareness even in the acquisition of their first (or dominant) language with large amounts of exposure (see reviews in Balthazar et al., 2020; Ebbels, 2014; Frizelle et al., 2021). Metalinguistic approaches to both vocabulary and grammar teaching appear even more vital in foreign language teaching to children with DLD because in this case the deficits are aggravated by limited exposure. Tribushinina et al. (2022, 2023b) compared EFL learning gains in Dutch-speaking primary-school children with DLD (age 9–12) following either a business-as-usual curriculum (implicit) or an explicit intervention raising metalinguistic and cross-linguistic awareness. Their results revealed significant progress in the intervention group after 12 weeks of explicit vocabulary (Tribushinina et al., 2023b) and grammar (Tribushinina et al., 2022) instruction, but no progress was observed in the business-as-usual group. The latter group received English lessons that were very similar to the English curriculum of our participants, but at a less advanced (primary school) level. The effectiveness of metalinguistic EFL teaching approaches is further supported by the results reported by Stolvoort et al. (2023) demonstrating significant gains in primary-school EFL learners with DLD in both vocabulary and grammar, after only 12 weeks of English lessons (45 min a week). The participants in their study received explicit instruction on Dutch-English cognates, which enhanced vocabulary recognition after the lesson series. In addition, each lesson involved shape-coding of English sentences and explicit cross-linguistic comparisons of English and Dutch grammatical structures. Taking the results of these studies together with our current findings, it appears that implicit EFL teaching approaches that are dominant in primary and secondary special education schools in the Netherlands are not effective, or may even be detrimental, for pupils with DLD. However, an important direction to pursue would be to directly compare EFL development during implicit and explicit instruction. This study did not include a control group receiving explicit instruction. As a consequence, it is unclear whether the attested lack of progress was the result of the type of instruction.

7.1. Age of instruction

Our participants were in the first year of secondary education, which means that they had previously attended different primary schools. Since Dutch primary schools show a lot of variability as to when pupils start English lessons, we were able to relate EFL performance to the onset of EFL instruction. The results have revealed that age of instruction is a significant positive predictor of grammar and vocabulary scores: Children who started English lessons at a later age obtained higher scores. This relationship was found for both grammar (at Time 1) and vocabulary (at both measurements). This result is consistent with a myriad of prior studies demonstrating that older pupils with typical language development learn foreign languages faster than younger foreign language learners (e.g., Jaekel et al., 2017; Muñoz, 2006; Navés et al., 2003; Pfenninger & Singleton, 2016). Our findings are also in line with research showing advantages of a later onset of L2 acquisition by children with DLD in naturalistic contexts (Blom & Paradis, 2015; Govindarajan & Paradis, 2019; Paradis et al., 2017). For foreign language learners with DLD in limited-input classroom settings, evidence so far is scarce and mixed. Tribushinina et al. (2023a) found no differences in performance of early and late starters on English vocabulary after four years of instruction, whereas Tribushinina et al. (2020) report an advantage of a later start, but only in EFL vocabulary and not in grammar. Our findings reveal robust effects of age of instruction in both language skills. For grammar, this

advantage was visible halfway through the school year and disappeared by the end of the school year. In contrast, for vocabulary, older starters retained their advantage even after having spent almost a whole school year with peers with an earlier onset. This suggests age of onset is a strong predictor of EFL learning, particularly in the domain of vocabulary (cf., Tribushinina et al., 2020). The observed advantage of later starters appears to be consistent with research that highlights the importance of more developed L1 knowledge and cognitive skills in EFL learning. At the start of EFL learning, older learners might be able to make use of positive L1 transfer to a larger extent than younger learners (Cummins, 1979; Tribushinina et al., 2020). In addition, later starters might be able to learn via declarative memory rather than procedural memory (Tribushinina et al., 2020), since this cognitive skill improves with age and can be used to circumvent deficits in procedural learning (Lum et al., 2012).

7.2. Out-of-school exposure

Even though age of instruction was a significant predictor of both grammar and vocabulary achievement, this was not the case for age of exposure, operationalized here as the age at which the pupils started regular contact with the English language outside of the classroom. In the same vein, amount of out-of-school exposure to English was not a significant predictor of performance on either of the measures at either timepoint. These results are in stark contrast to research on EFL learners with typical language development in classroom settings (Leona et al., 2021; Lindgren & Muñoz, 2013; Peters, 2018). These diverging results for children with and without DLD might be due to differences in the efficiency with which input is processed: For input to become uptake, language learners with DLD need greater amounts of linguistic input than learners with typical language development, and informal exposure to English in limited-input (foreign language) settings may not be sufficient for this (Tomblin et al., 2007). While later starters in school settings might be able to bypass their procedural learning deficits via ameliorating declarative memory (Lum et al., 2012), resulting in uptake in instructed learning situations, this mechanism may not be associated with EFL outcomes in naturalistic language learning outside of the classroom. Instructional settings, even largely implicit ones, like in the present study, contain more learning opportunities that address declarative memory compared to naturalistic learning settings. Therefore, later starters may be less able to make use of their strong declarative memory in naturalistic EFL learning than in instructed EFL learning, which might explain the absence of relationships between EFL achievement and age of exposure.

7.3. Affective factors

The role of affective factors has received a lot of attention in the literature on foreign language learners with typical language development, but has not yet been studied for EFL learners with DLD. Our study has embarked upon this new path and revealed a significant relationship between anxiety and EFL outcomes: Learners who experience more anxiety tend to achieve lower scores on both vocabulary and grammar. These findings match the negative association between anxiety and (E)FL achievement found in typically-developing language learners (Clément et al., 1994; Ellis, 2004; Leona et al., 2021; Pyun et al., 2014). It has been argued that anxiety and EFL achievement are related to each other in a bidirectional manner: Underachievement in EFL learning may cause anxiety since learners feel pressure to perform well in the EFL classroom, and anxiety may cause underachievement in EFL learning since it can weaken learning and performance on language tests (Ellis, 2004).

Although attitudes towards learning English in general did not constitute a significant predictor of EFL achievement, we found a positive relationship between attitudes towards English lessons and vocabulary achievement, meaning that learners who report more positive attitudes towards English lessons obtain higher vocabulary scores, which is in line with prior research on the role of motivation in typical EFL learning (Pfenninger & Singleton, 2016; Sanz, 2000). While the directionality of such relationships is unclear (Ellis, 2004), motivation is hypothesized to enhance induction and advancement of the EFL learning process (Dörnyei, 2005). Interestingly, a similar relationship was not found for grammar, which might be related to the fact that grammar constitutes a challenging domain for children with DLD and even high motivation levels do not help students to overcome difficulties with learning foreign language grammar.

However, it is important to mention that the relationships between EFL achievement and affective factors disappeared by the end of the first year of secondary school. These findings suggest that individual differences based on anxiety and attitudes can be neutralized, even though it has been suggested that affective factors are of great importance to the language learning process in children with low language aptitude (Dörnyei, 2005). It is not entirely clear why the relationship between EFL performance and the affective factors abates with time. It might be the case that motivational scores at Time 1 still largely reflected individual differences that were due to prior learning experience in different primary schools. After a year of English lessons in the same secondary school, and with the same teacher, individual differences in lesson appreciation and anxiety might have become smaller. However, it is unclear whether these findings are the result of instruction. Due to this limitation, future research on this topic will benefit from comparing the performance of learners in different conditions to examine the effects of instruction on the relationships between EFL outcomes and affective factors.

Another important direction to pursue would be to directly compare EFL achievement in typically-developing learners and learners with DLD. This study did not include a group of typically-developing learners. As a consequence, it is unclear whether the observed relationships are indeed different from those found in learners without DLD or whether these are an artifact of the used tests and/or design. Future research would benefit from a direct comparison to verify the differential effects of EFL learning predictors in DLD.

8. Conclusion

This study confirms prior research demonstrating that foreign language skills of children with DLD develop very slowly,

particularly when their foreign language curriculum is largely implicit. Our results further reveal that receptive grammar and vocabulary in English as a foreign language are positively related to the age at which learners with DLD first receive foreign language instruction: Later starters tend to obtain higher scores than earlier starters. Older learners are likely to have a faster learning rate due to L1 transfer and cognitive advantages. In contrast, age of (informal) exposure and amount of out-of-school exposure to English did not predict EFL outcomes, perhaps due to the small number of opportunities in which declarative memory can be used in naturalistic acquisition. Moreover, anxiety tends to be negatively related to achievement in both grammar and vocabulary, while attitudes towards English lessons are positively related to vocabulary outcomes. Nevertheless, these relationships change over time: Only the relationship between age of instruction and vocabulary scores remains stable by the end of the first year at secondary school. Lastly, positive associations between EFL outcomes, on the one hand, and age of instruction and affective factors, on the other hand, are more likely to occur in the domain of vocabulary than in the grammatical domain, which might be attributed to the fact that grammar is the most vulnerable language domain in children with DLD.

Funding

This work was supported by the Netherlands Organization for Scientific Research (NWO) under Grant 015.015.061 to the last author.

CRediT authorship contribution statement

Jasmijn Stolvoort: Formal analysis, Validation, Visualization, Writing – original draft, Writing – review & editing. **Megan Mackaaij:** Data curation, Investigation, Methodology, Project administration, Writing – review & editing. **Elena Tribushinina:** Conceptualization, Data curation, Formal analysis, Funding acquisition, Methodology, Project administration, Supervision, Validation, Writing – original draft, Writing – review & editing.

Acknowledgments

We would like to thank the two anonymous reviewers for their constructive feedback. We are also grateful to the school, teachers, parents, and children involved in the study, and Emily Poland, Betül Boz, and Maike Smit for collecting data.

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