STEM-, SPRAAK- EN TAALPATHOLOGIE

Vol. 27, 2022, Special Issue, pp. 1-23
Special Issue for Steven Gillis

Gepubliceerd online: 5 november 2022

University of Groningen Press
https://doi.org/10.21827/32.8310/2022-SG-1

Discontinuation of specialist educational provision for children with DLD in the Netherlands: performance and predictors

Tessel Boerma[1], Frank Wijnen[1], & Elma Blom[2]

[1] *Department of Languages, Literature and Communication & Institute of Linguistics OTS, Utrecht University*

[2] *Department of Education & Pedagogy, Development and Education of Youth in Diverse Societies, Utrecht University*

Samenvatting

Achtergrond. Taalontwikkelingsstoornis (TOS) wordt gekenmerkt door grote heterogeniteit, maar er is nog weinig bekend over de variatie in specialistische onderwijsondersteuning voor kinderen met TOS. Dit longitudinale onderzoek bestudeerde de taal- en leesvaardigheid van kinderen met TOS bij wie onderwijsondersteuning op 7- of 8-jarige leeftijd beëindigd werd en kinderen met TOS bij wie dit werd voortgezet, ten opzichte van typisch ontwikkelende kinderen. Daarnaast onderzochten we talige, cognitieve en omgevingsfactoren als voorspellers voor de beëindiging van specialistische onderwijsondersteuning.

Methode. Eentalige en meertalige kinderen met (n=120) en zonder (n=113) TOS namen deel aan het onderzoek. Gestandaardiseerde instrumenten werden gebruikt om de proportie van kinderen per groep met zwakke taal- en leesvaardigheid op 7- of 8-jarige leeftijd te beschrijven. Binaire logistische regressie werd uitgevoerd om de beëindiging van specialistische onderwijsondersteuning te voorspellen. Voorspellers waren talige en cognitieve vaardigheden op 5- of 6-jarige leeftijd, groei in taalvaardigheid, onderwijsniveau van ouders en meertaligheid.

Resultaten. Totaal had 25% van de kinderen met TOS geen specialistische onderwijsondersteuning meer op 7- of 8-jarige leeftijd. Meer meertaligen dan eentaligen behielden onderwijsondersteuning, hoewel dit verschil net niet significant was. Kinderen met TOS, zowel met als zonder onderwijsondersteuning, scoorden vaker zwak op de gestandaardiseerde instrumenten dan typisch ontwikkelende kinderen. Kinderen met TOS met specialistische onderwijsondersteuning presteerden vaker zwak dan kinderen met TOS zonder ondersteuning. Onderwijsniveau van ouders en morfologische vaardigheden, zowel op baseline als groei, voorspelden de beëindiging van onderwijsondersteuning.

Correspondentieadres:
Tessel Boerma
Utrecht University
Dept. of Languages, Literature and Communication
Trans 10, 3512 JK, Utrecht, The Netherlands
E-mail: t.d.boerma@uu.nl

Conclusies en implicaties. Specialistische onderwijsondersteuning bleek voor veel kinderen met TOS binnen een relatief kort tijdsbestek beëindigd te zijn. Hoewel deze kinderen sterker presteerden dan leeftijdsgenoten met TOS die ondersteuning behielden, was hun taal- en leesvaardigheid vaak zwak. Deze groep blijft dus kwetsbaar en behoeft aandacht. Vervolgonderzoek naar besluitvorming omtrent specialistische onderwijsondersteuning is nodig om de rol van onderwijsniveau van ouders en morfologische vaardigheden in de beëindiging van ondersteuning te begrijpen.

Abstract

Background. Developmental Language Disorder (DLD) is characterized by large heterogeneity, but little is known about the variation in specialist educational support that children with DLD receive. This longitudinal study compared the language and reading performance of children with DLD for whom provision had been discontinued at age 7 or 8 years and children with DLD for whom it was continued, relative to typically developing (TD) controls. Additionally, we investigated linguistic, cognitive and environmental predictors of the discontinuation of provision.

Methods. Monolinguals and bilinguals with (n=120) and without (n=113) DLD participated. Standardized measures were used to examine the proportion of children per group with poor language and reading ability at age 7 or 8. Binary logistic regression was conducted to predict the discontinuation of specialist educational provision, including language and cognitive skills at age 5 or 6, language growth, parental education and bilingualism.

Results. Specialist educational provision was discontinued for 25% of the children with DLD. More bilinguals than monolinguals received continuing support, although this difference fell just short of significance. Children with DLD, both with and without specialist provision, performed more poorly on the standardized instruments than TD children, and the children with DLD with provision more often scored poorly than those without provision. Parental education, as well as children's baseline scores on and growth in inflectional morphology, predicted the discontinuation of specialist educational support.

Conclusions and implications. Within a relatively short time period, specialist educational provision was discontinued for many children with DLD. Although these children perform better than peers with DLD with continuing specialist support, their language and reading skills are often poor. This group thus remains vulnerable and requires attention. Future research into decisions about specialist educational provision is needed to understand the role and relevance of inflectional morphology and parental education in the (dis)continuation of provision.

Introduction

Children with a Developmental Language Disorder (DLD) experience severe language difficulties which affect development and behavior in language and other domains of functioning, as well as their future life prospects (Curtis, Frey, Watson, Hampton, & Roberts, 2018;

Dubois et al., 2020; Eadie et al., 2018). There is a lack of clarity about the etiology of these language difficulties (Bishop, 2009), but there is consistent evidence that DLD is persistent (Botting, 2020; Clegg et al, 2005). The group of children with DLD is characterized by large heterogeneity (Bishop, Snowling, Thompson, Greenhalgh, & Catalise-2 consortium2017), for example in terms of the language domains that are affected, and the severity of the problems. Another factor that varies between individuals with DLD is the amount of support they receive (Clegg et al., 2005; Dockrell & Lindsay, 2008; Dockrell, Ricketts, Palikara, Charman, & Lindsay, 2019). Some individuals with DLD may receive intensive support throughout an extensive part of their lives, for example through specialist education services, whereas others receive such support only during a short period of time (Clegg et al., 2005; Dockrell & Lindsay, 2008; Dockrell et al., 2019). While the phenotypical heterogeneity of DLD is widely acknowledged, little is known about the factors that influence these differences in (educational) provision. For example, is short-term provision associated with children with 'transient' or 'resolved' DLD, with language outcomes indistinguishable from typically developing (TD) peers (as in Bishop & Edmundson, 1987)? Or do these children benefit from compensatory abilities or circumstances, such as high intellectual functioning or socioeconomic status?

Investigating these issues is important, as discontinuation of specialist educational support could present a risk if these children continue to struggle with language and additionally, develop reading difficulties and/or socio-emotional problems. Prognosis regarding the provision of specialist support is relevant for children and parents, but also for the professionals working with the children, and could provide insight into possible compensatory mechanisms that enable children with DLD to develop and learn without additional support. Therefore, the threefold aim of this study is to 1) establish for how many children with DLD in our Dutch cohort specialist educational support is discontinued at age 7 or 8 years old, 2) investigate how these children perform on standardized and norm-referenced language and literacy measures at this age, and 3) explore which factors predict the (dis)continuation of specialist educational provision at this age, including both language and cognitive skills two years earlier, as well as environmental factors.

Difficulties of children with DLD

The language difficulties of children with DLD can surface in all language domains. Although the symptoms of DLD can be manifold, difficulties with inflectional morphology are often considered highly characteristic of DLD (Leonard, 2014), and morphosyntactic errors have been the basis for clinical markers that are considered important for diagnosing DLD (Leonard, 2014; Rice & Wexler, 1996). Next to inflectional morphology, children with DLD are also known to often have weak syntactic and phonological skills, as for example reflected by poor performance on, respectively, sentence (Riches, 2012) and nonword repetition (Graf-Estes et al., 2007; Schwob et al., 2021) which have both also been proposed as clinical markers (Conti-Ramsden, Botting, & Faragher, 2001). Vocabulary is sometimes seen as a relative strength of children with DLD, but weaknesses relative to TD peers have been found in this domain as well (Rice & Hoffman, 2015). Narrative skills are also often reported

to be impaired in children with DLD (Duinmeijer, de Jong, & Scheper, 2012; Boerma, Leseman, Timmermeister, Wijnen, & Blom, 2016).

Although the language difficulties are of primary concern, children with DLD tend to perform less well than their TD peers in other domains. Co-morbidities with other neurodevelopmental disorders such as dyslexia (McArthur, Hogben, Edwards, Heath, & Mengler, 2000), autism spectrum disorder (Bishop, 2010), attention disorders (Mueller & Tomblin, 2012) and motor difficulties (Webster et al., 2006) are frequently observed, which is in line with co-morbidity rates in other developmental disabilities (Gilger & Kaplan, 2001). More generally, meta-analyses have shown that children with DLD tend to perform lower than their TD peers with respect to attention and executive functioning (Aljahlan & Spaulding, 2021; Ebert & Kohnert, 2011; Pauls & Archibald, 2016; Vugs, Cuperus, Hendriks, & Verhoeven, 2013), as well as intellectual functioning (Gallinat & Spaulding, 2014). This does, however, not hold for all children (e.g., Blom & Boerma, 2020). Problems of children with DLD, both within and beyond the domain of language, are highly variable.

Persistence of DLD

DLD is a disorder which has lifelong consequences. Long-term longitudinal studies show that the majority of children with DLD experience difficulties into adolescence and adulthood, both in and beyond the domain of language (Beitchman et al., 1996; Bishop & Edmundson, 1987; Botting, 2020; Clegg et al., 2005; Conti-Ramsden, Botting, Simkin, & Know, 2001; Dubois et al., 2020; Johnson et al., 1999; Scarborough & Dobrich, 1990; Snowling et al., 2006; Snowling et al., 2015; Stothard, Snowling, Bishop, Chipchase, & Kaplan, 1998; Tomblin, Zhang, Buckwalter, & O'Brien, 2003; Zambrana et al., 2014). For example, Botting (2020) analyzed follow-up data from individuals with DLD at age 24 years and found that only 26% obtained language scores in the average range. In the study by Johnson and colleagues (1999), including individuals at age 19 years, this was only 13%. At a younger age, investigating children between 3 and 8 years old, Snowling and colleagues (2015) report that 16% had resolved DLD, as defined by language scores in the average range. These relatively low percentages indicate that language problems are difficult to overcome and reflect the stability of language development trajectories across childhood, especially after age 4 years, as is also observed in TD children (Bornstein, Hahn, Putnick, & Suwalsky, 2014) and child population samples (McKean et al., 2017a; Norbury et al., 2017).

Given the persistent consequences of DLD, the common goal of professionals supporting children with DLD is to maximize a "child's functioning, activity, well-being and participation, in both education and socially" (Ebbels, McCartney, Slonims, Dockrell, & Norbury, 2019; p.5). When deciding on which type of support is best suited for a child, individual characteristics which have been found to predict whether the problems of a child with DLD persist over time, are thus highly relevant to consider. Early language ability is one of the strongest predictors for language outcomes later in life (McKean et al., 2017b). Research shows that the lower a child scores on standardized language measures, and thus the more severe the impairment may be, the more likely this child is to have persistent language problems and, moreover, develop reading difficulties when growing up (Snowling, Duff, Nash, &

Hulme, 2015). Particularly children with low scores on both expressive and receptive language tests are at risk for poor outcomes later in life, both in the domain of language (Bishop & Edmundson, 1987; Zambrana, Pons, Eadie, & Ystrom, 2014), as well as socio-emotional and behavioral development (Beitchman et al., 1996; Snowling, Bishop, Stothard, Chipchase & Kaplan, 2006). Other research also points to narrative skills as an important predictor (Bishop & Edmundson, 1987). The severity of DLD and types of problems are thus informative about prognosis and co-occurring problems beyond language, and are, as indicated by a survey study in the United Kingdom (Dockrell, Lindsay, Letchford, & Mackie, 2006), therefore often taken into account when decisions on specialist educational provision are made.

However, next to characteristics which are linguistic in nature, there are also cognitive and environmental factors which have been found to predict the persistence of DLD. In a meta-analysis on language outcomes in late talkers, Fisher (2017) showed that parental socioeconomic status, next to early expressive vocabulary and receptive language, was significantly related to a child's later language skills. Moreover, a study by Botting (2005) also points to the importance of nonverbal intellectual functioning. The fact that a discrepancy between non-verbal and verbal abilities was reported to be one of the main criteria for admission to specialist provision in the United Kingdom (Dockrell et al., 2006), highlights the importance of individual characteristics beyond the domain of language.

Specialist educational provision of children with DLD in the Netherlands

Allocation of support to children with DLD in schools or private clinical settings is important, because it helps reducing barriers in communication and learning caused by severe and persistent language problems. However, not all children may receive the support they need. Comparing support provided to children with DLD and Autism Spectrum Disorder (ASD), Dockrell et al. (2019) found that children with ASD are more likely to receive support than children with DLD, independent of language, literacy, cognitive scores, and behavior. The study by Dockrell and colleagues is situated in the United Kingdom, and while specialist educational provision for children with disabilities varies from country to country (Wood & Bates, 2020) and provision of services to children with DLD is dependent on national policies and governance (Law, McKean, Murphy, & Thordardottir, 2019), the issue of what drives specialist educational support is relevant across countries. For this study, we specifically looked into *discontinuation* of specialist educational provision of children with DLD. This study is situated in the Netherlands and, before turning to the present study, we briefly describe the Dutch support system insofar as it is relevant to DLD.

Special needs education in the Netherlands is organized in 'cluster-schools' for visually impaired or blind children (cluster 1), children who are deaf, hard of hearing, or have speech and/or language difficulties (cluster 2), children who have cognitive or physical disabilities (cluster 3), and children with behavioral or psychiatric problems (cluster 4). Cluster 2 school teams consist of special educational needs-teachers, remedial teachers, speech and language therapists, and child psychologists. In 2021, a total of 71,605 children and adolescents attended special primary and secondary education; 6,613 were enrolled in cluster 2 primary education and 1,589 in cluster 2 secondary education (Nederlands Jeugdinstituut,

2022), many of whom are diagnosed with DLD. However, more than 50% of the children with DLD take part in mainstream education and receive additional specialist support there (Koninklijke Auris Groep 2017, as cited in Gerrits et al., 2019). Many of these children enrolled in mainstream education also visit speech language therapy practices after school hours (Gerrits et al., 2019).

The law states that parents have the right to choose a school for their child, but specialist educational provision is also dependent on eligibility. Whether or not a child is eligible, either for special education or mainstream education with additional specialist support, is determined by a committee of inquiry (Commissie van Onderzoek 'CvO') of the organization that provides specialized education and support, in agreement with parents and school (Stichting Siméa, 2014). The decision is based on a development perspective plan, drafted by the school, that motivates the application for specialized support. It considers a child's learning capacity and skills, socio-emotional development, communicative self-reliance in educational situations, academic perspective, goals for the child, as well as individual risk and protective factors (Stichting Siméa, 2017). In addition, a child's difficulties need to be sufficiently severe as indicated by: 1) a diagnosis of DLD provided by a multidisciplinary assessment team or suspected DLD if children are still very young, 2) no effects of routine speech and language therapy, and 3) severe problems in one or more of the following four language areas: speech, grammar, semantics, pragmatics, as demonstrated by an overall score of below -2 standard deviations (SD) on a norm-referenced language assessment battery, or -1.5 SD on at least two of the four areas, or -1.3SD on at least three out of the four areas (Stichting Siméa, 2017). The committee of inquiry also determines the duration of specialist educational provision.

Present study

Some children with DLD receive specialist educational provision throughout primary education (and beyond), while for others additional specialized support is discontinued. Little is known about these two groups of children. The main aim of this study was to fill this gap.

Our first aim is to establish how many children with DLD in the cohort that we followed did not receive specialist educational provision anymore at age 7-8 years. In addressing this issue, it is relevant to distinguish between monolinguals and bilinguals. The reason is that, in the Netherlands, bilingual children are overrepresented in special education for children with DLD (Smeets, Driessen, Elferink, & Hovius, 2009), which may suggest that monolingual children are less likely to receive specialist educational provision than bilinguals. Note that specialist educational provision may not only have positive consequences: it could also mean that bilingual children are more likely to be considered at risk than monolinguals and, as a result, are deprived of mainstream education.

The second research aim is to investigate how 7- and 8-year-old children with and without specialist educational provision perform on standardized and norm-referenced language and literacy measures, and to determine if patterns are the same for monolingual and bilingual children. It may be expected that the children who do not receive specialist educational provision are more likely to score within the normal range on language measures than their

peers with educational provision, and that their language problems are to some extent more transient (Bishop & Edmundson, 1987). However, whether this is indeed the case, is currently unknown. It is important to examine this, as the children without specialist educational provision may run the risk of falling through the cracks if their language skills are still weak. This is not only relevant for language outcomes but also for literacy skills, because children with weak language skills at earlier ages are likely to develop literacy problems at age 7 (McKean et al., 2017b), and children with DLD show consistently lower reading outcomes than TD peers (Catts, Bridges, Little, & Tomblin, 2008).

The third research aim of the current study is to retrospectively explore factors that may predict (dis)continuation of specialist educational provision at age 7-8 years, focusing on linguistic, cognitive, and environmental variables. Children with DLD with higher language outcomes at age 5-6 years or who show a relatively steep growth in language may be more likely to do without specialist educational provision at age 7-8 years, as they may have a less severe and persistent disorder (McKean et al., 2017b). As explained above, factors related to children's functioning in a school environment and their future academic prospects are also considered in the decision to (dis)continue educational provision, in addition to severity of the condition. Therefore, those areas in language that are thought to be crucial for academic performance, such as vocabulary and narrative skills (Bishop & Edmundson, 1987; Dickinson & Tabors, 2002), could have a higher predictive value than the areas that are affected most by DLD, such as morphosyntax. Relatedly, competencies outside the domain of language, such as sustained attention and learning capacity (Dockrell et al., 2019; West, Shanks, & Hulme, 2021), or environmental variables related to the amount of support that can be provided at home by parents (Fisher, 2017), could be significant predictors.

Methods

Participants

The data for the present study were collected within the longitudinal research program called 'Cognitive Development in the Context of Emerging Bilingualism' at Utrecht University. Participating children were followed over the course of two years and were tested three times with yearly intervals. At wave 3, the children were around 7 or 8 years old. The sample of the present study includes all children for whom data from the first and third wave were available. From this sample, four children with DLD were excluded, because they transferred to special education for children with intellectual disability (cluster 3) during the data collection. One child with DLD was furthermore excluded due to hearing impairment, and another child with DLD was excluded because we had no information on the specialist educational provision at wave 3. Finally, two TD children were excluded, as one was diagnosed with ASD and one with DLD during the course of the study. The final sample included 233 children (see Table 1 for background characteristics).

The children with DLD were recruited via organizations that provide care and education services for children with communication problems (mainly Royal Dutch Kentalis and

Table 1: Background characteristics of the groups of participants

			Sex	**Age in months at wave 3**	**Nonverbal intelligence**	**Parental education**[a]
		N	Girls/Boys	Mean (*SD*)	Mean (*SD*)	Median (range)
DLD	**Monolingual**	88	22/66	94.8 (6.8)	94.2 (17.6)	5.5 (2-9)
	Bilingual	32	10/22	94.7 (8.8)	94.7 (15.3)	5.8 (2-9)
TD	**Monolingual**	43	20/23	94.3 (8.1)	106.5 (15.4)	7.0 (2-9)
	Bilingual	70	39/31	91.5 (7.1)	96.8 (13.8)	5.0 (1-9)

[a]This information was missing for four monolingual children with DLD and seven bilingual typically developing children.

Royal Auris Group). At the start of the longitudinal study, they had all been found eligible for specialist educational support for their language difficulties. This was determined through a standardized protocol (Stichting Siméa, 2017), as described in the introduction, before and independent of their participation in the research. For the bilingual children, a bilingual anamnesis was used and, if possible, testing was done in both languages (following the guideline of Stichting Siméa, 2016). During data collection, relevant changes in, among others, children's eligibility for specialist educational support were monitored through close contact with the schools, parents and other caregivers. The TD children were recruited via regular elementary schools. There were no concerns about their development.

All participating children were born in the Netherlands. A parental questionnaire (*Questionnaire for Parents of Bilingual Children* (PaBiQ); Tuller, 2015) was used to determine whether a child was monolingual or bilingual. Bilingual children had one or both parents who were native speakers of a language other than Dutch and spoke their native tongue with the child throughout an extensive period of the child's life. We measured the percentage of exposure to Dutch before the age of 4 years (bilingual TD: $M = 44.6$, $SD = 10.1$; bilingual DLD: $M = 40.9$, $SD = 11.1$) and percentage of exposure to Dutch at home at wave 1 (bilingual TD: $M = 54.2$, $SD = 13.4$; bilingual DLD: $M = 45.2$, $SD = 16.5$). All bilingual TD children were from Turkish or Moroccan descent, and thus came from the largest immigrant groups in the Netherlands. The bilingual DLD group was more heterogeneous in terms of other languages, but over 70% of the children was also from Turkish or Moroccan descent. Monolingual children had parents who spoke Dutch with them.

Instruments

Parents and/or schools of children with DLD were asked about the specialist educational provision of a participating child at each wave of the study. For the current study, the information from wave 3 will be used to categorize children with DLD in a group with and

a group without specialist educational provision. Other instruments are described below, starting with the standardized language and reading measures which are relevant for the second research aim, followed by the instruments which we additionally use in our prediction analysis for the third research aim.

Inflectional Morphology. The subtest Word Formation of the *Taaltoets Alle Kinderen* (TAK [Language Test for All Children]; Verhoeven & Vermeer, 2001) was used to measure Dutch inflectional morphology. In this test, children saw a picture and heard an incomplete sentence. They were asked to finish the sentence, thereby eliciting the plural form of a noun (12 items) and the past participle of a verb (12 items). The maximum score was 24 points. Based on their raw scores and school grade, children can be categorized into norm groups. There are five norm groups for monolingual children ('A' through 'E') and three for bilingual children ('high' through 'low'). For the current study, monolingual children in norm group 'D' and 'E' and bilingual children in norm group 'low' were classified as poor performers.

Function words and sentence patterns. The subtest Sentence Formation of the TAK (Verhoeven & Vermeer, 2001) was used to measure knowledge of Dutch function words and sentence patterns. Children heard a sentence and were asked to repeat this sentence as precisely as possible. Each sentence contained a sentence pattern and a function word which could both be awarded one point if repeated correctly. With 20 sentences in total, children could thus maximally score 40 points. For this test, the same norm groups were used as for the TAK Word Formation subtest.

Receptive vocabulary. The *Peabody Picture Vocabulary Test* (PPVT-III-NL; Schlichting, 2005) was used to test Dutch receptive vocabulary. Children saw four pictures and heard a target word. They were asked to point to the picture which corresponded to the target word. The PPVT contains 204 items which are divided over 17 sets with increasing complexity. In agreement with the official guidelines, a starting set was determined based on a child's age and the test was terminated if the child made nine or more errors in one set. Based on a child's age, raw scores can be converted to norm scores with a mean of 100 and standard deviation of 15. For the current study, children scoring below -1 SD were classified as poor performers. Bilingual norms are not available for this measure.

Word and pseudoword reading. Word reading ability was measured with the *Eén-Minuut-Test* (EMT [One-Minute-Test]; Brus & Voeten, 1999) and pseudoword reading with the Klepel (Van den Bos, Lutje Spelberg, Scheepstra, & De Vries, 1994). Children were presented with a list of 116 words (EMT) or pseudowords (Klepel) which increased in difficulty. They were asked to read as many words as possible in one minute, and as many pseudowords as possible in two minutes. Based on a child's age, the number of correctly read (pseudo)words can be converted to norm scores with a mean of 10 and a standard deviation of 3. A standard score of 6 or lower was considered poor.

Phonological short-term memory. Phonological short-term memory was measured with the Dutch version of the *Cross-Linguistic Nonword Repetition Task* (CL-NWRT; Boerma et al., 2015; Chiat, 2015). Children were asked to repeat a total of 16 nonwords. The nonwords had two to five syllables and were composed of sounds and sound structures which are frequent in many languages in the world. Bilingual children are therefore not disadvantaged due to having had less exposure to a specific language (Boerma et al., 2015). Responses were scored

on a whole-item basis, which meant that the maximum score was 16.

Narrative production. Narrative skills were measured with the *Multilingual Assessment Instrument for Narratives* (MAIN; Gagarina et al., 2012; Blom, Boerma, & de Jong, 2020). Children first heard a model story based on a picture sequence. Subsequently, children saw a different picture sequence and were asked to tell their own story. The number of correct plot elements (including the setting, goal, attempt, result, and internal states) in their story were scored and constituted the measure for narrative production. The maximum score was 17.

Sustained attention. Sustained attention was measured with an integrated auditory and visual *Continuous Performance Task* (CPT; see Boerma et al., 2017). Children saw or heard the number '1' or the number '2'. They were asked to press the space bar in response to the number '1', which was the target, and refrain from responding to the number '2', which was the distractor. There were 168 test trials, evenly distributed between targets and distractors. The outcome variable 'd-prime' was used, which is a dual score based on both the ratio hits in response to targets as well as false alarms in response to distractors.

Nonverbal intellectual functioning. The short version of the *Wechsler Nonverbal-NL* (Wechsler & Naglieri, 2008) was used to measure nonverbal intellectual functioning. Two subtests, Matrices and Recognition, were administered with the use of minimal verbal instructions. Raw scores on both subtests can be converted to T-scores and, together, constitute a quotient score with a mean of 100 and a standard deviation of 15.

Parental Education. The *PaBiQ* (Tuller, 2015) was used to gain information on the education level of a child's parents. Education level was measured on a nine-point scale, ranging from 0 (no education) to 9 (university degree). This was filled in for a child's mother and father, and the average of both was taken as outcome variable.

Procedures

The longitudinal research program was approved by The Standing Ethical Assessment Committee of the Faculty of Social and Behavioral Sciences at Utrecht University (file number 22-0098). Informed consent forms were signed by parents of participants. Children were individually tested in a quiet room at school. A native speaker of Dutch administered tasks tapping into language, attention and memory. At each wave of data collection, there were two test sessions of approximately one hour.

Data analysis

Data analysis was done in SPSS, version 26 (IBM Corp., 2016). For the first research aim, we counted the number of children who did (DLD+) and did not (DLD-) have specialist educational provision at wave 3 and assessed whether the groups differed on background characteristics. Using a Pearson's chi-squared (χ^2) test, we furthermore investigated whether the proportion of children in the DLD+ and DLD- groups differed in the monolingual and bilingual group of children with DLD. This is a clean comparison, as these groups did not differ on any of the background variables which were presented in Table 1 (age at wave 3: $F(1,118) = .01$, $p = .94$, $\eta_p^2 < .001$; nonverbal intelligence: $F(1,118) = .03$, $p = .87$, $\eta_p^2 < .001$; parental education: $U = 1244.5$, $z = -.62$, $p = .54$; sex: $\chi^2(1, N=120) = .47$, $p = .49$).

For the second research aim, we investigated the number of children who performed poorly on the standardized language and reading measures described above. We compared the DLD+, DLD- and TD groups, as well as monolinguals and bilinguals separately. As standardized scores were used, which correct for age, potential age differences between the groups were accounted for. Other background variables are, however, not taken in account and comparisons between the groups are therefore reported here. The monolingual TD children and monolingual children with DLD differed on nonverbal intelligence ($F(1,129) = 15.5$, $p < .001$, $\eta_p^2 = .11$) and parental education ($U = 1146.0$, $z = -3.38$, $p = .001$), with monolingual TD children scoring higher than monolingual children with DLD. The group of monolingual children with DLD included a relatively high number of boys in comparison with the monolingual TD group ($\chi^2(1, N=131) = 6.2$, $p = .01$). In the bilingual groups, there were no differences on nonverbal intelligence ($F(1,100) = .48$, $p = .49$, $\eta_p^2 = .01$) and parental education ($U = 832.0$, $z = -1.39$, $p = .16$). The group of bilingual children with DLD included a relatively high number of boys in comparison with the group of bilingual TD children ($\chi^2(1, N=102) = 5.3$, $p = .02$). Moreover, there were no differences between the bilingual groups in terms of exposure to Dutch before the age of 4 years ($F(1,93) = 2.60$, $p = .11$, $\eta_p^2 = .03$), but the bilingual TD children received significantly more Dutch exposure at home at wave 1 than the bilingual children with DLD ($F(1,92) = 8.07$, $p = .006$, $\eta_p^2 = .08$).

Finally, in line with the third research aim, we did a binary logistic regression analysis to explore predictors of the discontinuation of specialist educational provision in our sample. Our selection of variables is based on linguistic, cognitive and environmental factors that may be considered when deciding on specialist educational provision for children with DLD in the Netherlands (Stichting Siméa, 2017) and that have been found to predict later outcomes in previous research, as has been described in the introduction. The following variables, all assessed at wave 1, were added as predictors in our model: Dutch inflectional morphology, Dutch knowledge of function words and sentence patterns, Dutch receptive vocabulary, phonological short-term memory, narrative production, sustained attention, nonverbal intellectual functioning, parental education, and bilingualism. Furthermore, we included two variables which were indicative of language growth. We subtracted the raw scores of the TAK Word Formation and TAK Sentence Formation at wave 1 from the raw scores at wave 3. Both difference scores were included in our prediction model. The backward stepwise method was used to report results from the full model with all predictors and

the final model which minimized the number of predictors.

Results

Research aim 1. DLD+ vs. DLD-: numbers and background characteristics

Table 2 shows the characteristics of children with DLD who did (DLD+) and did not (DLD-) have specialist educational provision at wave 3. In total, a quarter of the children with DLD did not receive specialist educational support anymore at wave 3. In the monolingual group, this was one-third of the children, while it was only one-eighth of the children in the bilingual group. This difference between the monolingual and bilingual groups fell just short of significance (χ^2)(1, N=120) = 3.6, p = .057).

The DLD+ and DLD- groups did not differ in age at wave 3 (F(1,118) = .84, p = .36, η_p^2=.01), nonverbal intelligence (F(1,118) = .09, p = .77, η_p^2=.001) and sex (χ^2)(1, N=120) = .23, p = .63)), but there were significant differences in parental education (U = 934.0, z = -2.10, p = .04). Parents of children in the DLD- group had, on average, a higher educational level than parents of children in the DLD+ group. The group comparisons showed similar results when analyzing the monolingual and bilingual group separately, although the difference in parental education was not significant in the bilingual group. Percentage of exposure to Dutch before the age of 4 years (bilingual DLD+: M = 39.6, SD = 10.3; bilingual DLD-: M = 50.0, SD = 13.6) and exposure to Dutch at home at wave 1 (bilingual DLD+: M = 42.9, SD = 13.9; bilingual DLD-: M = 60.8, SD = 26.7) were also not significantly different between the groups. However, as there were only four bilingual children in the DLD- group, these results must be interpreted with caution.

Table 2: Children with DLD who did (DLD+) and did not (DLD-) meet the criteria for specialist educational support at wave 3

			Gender	**Wave 3**	**Nonverbal intelligence**	**Parental education**[a]
		N (%)	Girls/Boys	Mean (*SD*)	Mean (*SD*)	Median (range)
DLD+	**Total**	90 (75.0%)	25/65	94.4 (7.7)	94.0 (16.4)	5.5 (2-9)
DLD-		30 (25.0%)	7/23	95.9 (6.2)	95.1 (18.8)	6.3 (3-9)
DLD+	**Monolingual**	62 (70.5%)	46/16	94.5 (7.2)	93.5 (17.1)	5.5 (2-8.5)
DLD-		26 (29.5%)	20/6	95.7 (5.9)	95.7 (19.0)	6.3 (3-9)
DLD+	**Bilingual**	28 (87.5%)	9/19	94.4 (8.9)	95.3 (15.0)	5.8 (2-9)
DLD-		4 (12.5%)	1/3	97.0 (8.6)	91.0 (19.1)	6.0 (3.5-8)

[a] This information was missing for four monolingual children.

Research aim 2. DLD+ vs. DLD- vs. TD: standardized language and literacy measures

Table 3 presents the number of children per group who perform poorly on standardized language and reading instruments at wave 3. For all instruments and for both the monolingual and bilingual group, it can be observed that the proportion of TD children performing poorly on the standardized instruments is lower than the proportion of children with DLD (both DLD+ and DLD-). In addition, more children in the DLD+ group than in the DLD- group perform poorly on the TAK word formation and TAK sentence formation task, with the largest difference on the word formation task. This can be observed in both the monolingual and bilingual group. No clear distinction between the DLD- and DLD+ group is seen on the PPVT, neither in the monolingual nor in the bilingual group. On the reading measures, there are more poor readers in the monolingual DLD+ group than in the monolingual DLD- group, whereas this is not the case in the bilingual group. Again, results in the bilingual group warrant caution given the small sample in the bilingual DLD- group.

Table 3: Number of children per group performing poorly on standardized language and reading measures at wave 3

		TAK word formation[a]	**TAK sentence formation**[a]	**PPVT**[b]	**EMT**[c]	**Klepel**[c]
		N (%)	*N (%)*	*N (%)*	*N (%)*	*N (%)*
DLD+		64 (71.1%)	72 (80.0%)	21 (23.3%)	37 (41.1%)	36 (40.0%)
DLD-	***Total***	9 (30.0%)	20 (66,7%)	5 (16.7%)	9 (30.0%)	11 (36.7%)
TD		16 (14.2%)	21 (18.6%)	14 (12.4%)	8 (7.1%)	7 (6.2%)
DLD+		47 (75.8%)	48 (77.4%)	6 (9.7%)	30 (48.4%)	29 (46.8%)
DLD-	**Monolingual**	8 (30.8%)	17 (65.4%)	3 (11.5%)	8 (30.8%)	9 (34.6%)
TD		6 (14.0%)	8 (18.6%)	1 (2.3%)	4 (9.3%)	4 (9.3%)
DLD+		17 (60.7%)	24 (85.7%)	15 (53.6%)	7 (25.0%)	7 (25.0%)
DLD-	**Bilingual**	1 (25.0%)	3 (75.0%)	2 (50.0%)	1 (25.0%)	2 (50.0%)
TD		10 (14.3%)	13 (18.6%)	13 (18.6%)	4 (5.7%)	3 (4.3%)

[a] For monolingual children, the number of children scoring in category D and E is counted (lowest 25%). For bilingual children, the number of children scoring in category 'low' is counted (lowest 16%).
[b] The number of children scoring 1 SD below the mean is counted (<85).
[c] The number of children scoring below 7 is counted.

Research aim 3. Predictors of discontinuation of specialist educational provision

Table 4 presents the outcome of the binary logistic regression with which we aim to identify variables that predict the discontinuation of specialist educational support in our sample.

The binary logistic regression showed that our model including eleven predictors was statistically significant from the intercept only model (χ^2)(12, N=109) = 37.34, $p < .001$, Nagelkerke R^2 =.43). In this model, scores on the TAK Word Formation task at wave 1 and parental education significantly predicted whether children with DLD would have specialist educational provision at wave 3. Discontinuation of provision was more likely for children with higher TAK Word Formation scores and for children with parents with a higher parental education level. There was also a marginally significant effect of growth on the TAK Word Formation task (i.e., the difference in scores on wave 3 and wave 1). These three predictors were also included in the final model (χ^2)(3, N=109) = 31.88, $p < .001$, Nagelkerke R^2 =.38), using the backward stepwise method. When we ran the analysis with data from only the monolingual children, the final model also included the same predictors.

Table 4: Outcome of binary logistic regression

Model	**Predictors included**	**B**	**S.E.**	Wald	***p***
	Inflectional morphology	-.253	.124	4.124	.042
	Function words and sentence patterns	-.073	.059	1.564	.211
	Receptive vocabulary	.025	.034	.530	.467
	Phonological short-term memory	-.010	.019	.279	.597
Full	Narrative production	-.036	.032	1.209	.271
	Sustained attention	.304	.430	.499	.480
	Nonverbal intellectual functioning	-.002	.019	.011	.917
	Parental education	-.394	.173	5.165	.023
	Growth on inflectional morphology	-.194	.106	3.353	.067
	Growth on function words and sentence patterns	-.045	.054	.687	.407
	Bilingualism	1.320	.905	2.127	.145
	Inflectional morphology	-.362	.088	17.016	.000
Final	Parental education	-.324	.150	4.639	.031
	Growth on inflectional morphology	-.238	.087	7.558	.006

Note. There was missing data for 11 children. The regression analysis was therefore run with 109 participants.

Discussion and conclusion

Children with DLD experience language difficulties in the absence of a clear cause, but it is widely acknowledged that there is large heterogeneity within the group of children with DLD with respect to the severity of these difficulties, the affected language domains, and weaknesses beyond language. Far less is known about the variation in specialist educational support that children with DLD receive for their difficulties and factors which predict this

variation. Using data from a longitudinal study including a cohort of monolingual and bilingual children with and without DLD between 5 and 8 years old, the current study set out to fill this gap.

We first aimed to establish for how many children with DLD in the cohort specialist educational provision was discontinued at age 7 or 8 years old. All children received specialist support when they were 5 or 6 years old, at wave 1 of the study, but this changed for a quarter of the sample two years later. Within two years, a large proportion of the children with DLD did not have specialist educational provision anymore. This contrasts with findings from the study by Dockrell et al. (2019) in the United Kingdom, who observed no differences in amount of support provided by schools over a two-year time period. Their study included children who were, on average, 10 years old at the first time point and who were thus substantially older than the participants of the current study. It may be that changes in specialist educational support more often occur at younger ages, when development is more dynamic and when the needs of a child have not yet crystallized. The severity of DLD and criteria for specialist educational provision may, however, also explain the differences in results between the current study and the study by Dockrell et al. (2019). The current study focused on a group of children with relatively severe difficulties, as children are otherwise not eligible for specialist educational support in the Netherlands. Such stringent criteria may result in more frequent changes in eligibility for support. However, alternatively, stringent criteria may also result in fewer changes in eligibility for support, because children who have more severe and persistent problems will be singled out and are less likely to improve.

Comparisons between monolingual and bilingual children with DLD showed that specialist educational provision was discontinued for nearly 30% of the monolingual children, while this was only 12.5% for the bilingual children. Although this difference fell just short of significance, this finding seems to indicate that bilingual children are more likely to receive specialist educational support for a longer period than monolingual children. This is interesting in view of the known overrepresentation of bilingual children in special education (Smeets et al., 2009). Comparisons in the full sample between children with DLD with and without specialist educational provision at wave 3 furthermore showed significant differences in parental education between the groups, with parents from children without provision having a higher level of education than parents from children with provision. Other differences in background characteristics were not significant. The effect of bilingualism and parental education both seem to indicate that environmental factors play a role in the discontinuation of specialist educational support for children with DLD. We will elaborate on this in our discussion of the third aim of this study.

The second aim was to investigate how children with DLD for whom specialist educational provision was discontinued perform on standardized and norm-referenced language and literacy measures, relative to TD children and children with DLD who did continue to receive specialist educational support. Our results showed clear differences between the two groups of children with DLD on the one hand and TD children on the other hand, both in the monolingual and bilingual group, with larger proportions of children with DLD scoring poorly on the standardized language and literacy measures than TD children. Except for the receptive vocabulary measure, the children with DLD with specialist educational sup-

port more often scored poorly than the children with DLD without this support. The difference was particularly striking on the word formation task assessing expressive inflectional morphology. These findings seem to reflect that severity of the language difficulties is considered when decisions on specialist educational provision are made (Dockrell et al., 2006; Stichting Siméa, 2017). They also suggest that, while their language difficulties may be less severe, the children with DLD in this sample without specialist educational provision cannot be classified as having 'transient' or 'resolved' DLD (Bishop & Edmundson, 1987). Both language and reading difficulties are observed in many children in this group, while they do not receive specialist educational support. Although it may be that they still do receive speech and language therapy or remedial teaching, this shows that this group of children remains vulnerable and requires attention. It may also be that these children function well without specialist provision, despite their lower test scores. For example, knowledge of language structures and rules, measured by such tests, may not automatically capture a child's communicative participation outcomes (Singer, Klatte, Welbie, Cnossen, & Gerrits, 2020). We were not able to include outcomes of communicative participation in the current study, while this may have played an important role in the decision process regarding provision.

Finally, the third aim of the study explored which linguistic, cognitive, and environmental factors predict the (dis)continuation of specialist educational provision of children with DLD. Parental education and scores on the word formation task, both at baseline and growth, turned out to be significant. The importance of the word formation task may, as previously mentioned, signal that children with more severe language difficulties are also more likely to have specialist educational provision during a longer period. Given the fact that early language abilities are highly predictive of later outcomes (McKean et al., 2017b), this suggests that those who need most support also receive most support. However, other linguistic variables, including sentence repetition, vocabulary, and narrative tasks were not found to be significant predictors in our model, while they are reported to be crucial for academic performance (Bishop & Edmundson, 1987; Dickinson & Tabors, 2002; West et al., 2021). It may be that the word formation measure is a proxy for a more complex or multi-factorial profile of difficulties. Additionally, there are several more specific reasons why the word formation task may be particularly sensitive to changes in specialist educational provision. First, word formation could be a better index of DLD severity than the other language measures, because the correct use of inflectional morphology is a core problem of children with DLD learning Dutch (de Jong, 1999). Inflectional morphology has, moreover, a rule-like nature, which shows a steep increase in development reflecting detection of the pattern and mastery of the rule (Rice, 2012). Children who struggle most in this area and do not show such growth may be the ones with the most persistent problems. In line with this idea, it could also be that difficulties in the area of morphology are most salient to professionals, increasing the likelihood that children making many morphological errors are evaluated as severe cases of DLD. Finally, we also consider the possibility that the word formation task taps into other underlying domain-general learning skills, such as procedural learning (e.g., Hamrick, Lum, & Ullman, 2018), which are relevant for the assessment of eligibility of specialist educational support.

Cognitive factors, including sustained attention and nonverbal intellectual functioning,

were not found to be predictive of specialist educational support. This is not in line with our expectations, as learning capacity and nonverbal abilities are considered when decisions on specialist educational provision are made (Dockrell et al., 2006; Stichting Siméa, 2017). Moreover, Dockrell et al. (2019) also found nonverbal intellectual functioning to be a significant predictor of the number of hours of school support in the United Kingdom. Our findings, however, do not indicate that children with DLD without specialist educational provision benefit from more cognitive strengths, which could have compensated their linguistic weaknesses, than peers with provision. In contrast, parental education level was higher for children in this group, relative to children with DLD with educational provision. Given the importance of parental education for later language outcomes (Fisher, 2017), high parental education may be seen as a protective factor, increasing the likelihood of discontinuation of specialist educational support. Note that variables that predict the discontinuation of specialist educational provision can be labelled as protective factors if the children indeed do not need continuing support. It is also possible that children would still profit from additional support, even though they are not eligible anymore, and in this case, predicting variables (such as parental education) are risk factors. Another explanation for why parental education significantly predicted specialist educational provision is that decisions on (dis)continuation of support are made in agreement with parents (see also Dockrell et al., 2006) and that parents with a relatively high level of education are more likely to opt for regular education without specialist support for their child. Finally, higher levels of parental education may also indirectly reflect genetically determined compensatory abilities, such as strong planning skills, which could explain discontinuation of provision, but which were not included in the present study. Bilingualism was not found to be a significant predictor in our regression model. However, the difference in the proportion of monolingual and bilingual children with DLD for whom specialist educational provision was discontinued fell just short of significance and may indicate that professionals take amount of exposure in the school language into account when deciding on continuation of provision.

Our data show that specialist educational provision is terminated within a relatively short period of time for a significant proportion of children with DLD. We do not know whether the percentage of discontinuations we observe in the current study can be generalized to the population of children with DLD attending special education, but given the size of our sample, we believe our figures are certainly indicative. The language and literacy scores show that the children for whom provision was discontinued cannot be qualified as children with a 'resolved DLD'. One question that can be asked is how the further educational career of these children progresses, and what their final levels are. To our knowledge, no research has yet been conducted in the Netherlands into the long-term outcomes regarding education (and also professional practice and social success) in children with DLD. Such research is desirable, especially when it makes a distinction between those individuals who have participated in special education for a longer period, in comparison to those who were referred to lighter or no educational arrangements.

It is interesting and important to understand the grounds on which professionals decide whether a child can do without specialist educational provision. Our results suggest that mono- versus bilingualism plays a role, as does parental education level. In the Dutch con-

text, these two variables are not easy to separate, so further research is recommended. It is remarkable that a child's performance in the morphological domain, and progress therein, is predictive of the decision to discontinue specialist educational support, while other linguistic and cognitive factors were not. Of course, we do not know whether the predictors that our analysis identified as significant correspond to the factors professionals consider when deciding whether a child can be discharged from special education. In a follow-up study, it therefore seems useful to us to have professionals in special education reflect on the decision-making process regarding (dis)continuation of specialist support, as has been done in the United Kingdom (Dockrell et al., 2006). The question is whether what they see as relevant factors, related to characteristics of the child itself, their family and socio-cultural background, are consistent with the results reported here. Such a study could contribute to strengthening the evidence base for decision-making regarding the guidance of children with DLD.

Author contributions

Conceptualization, E.B.; Formal analysis, T.B.; Funding acquisition, E.B.; Investigation, T.B.; Methodology, T.B. and E.B.; Supervision, E.B. and F.W.; Writing - original draft, T.B. and E.B.; Writing - review & editing, T.B., F.W., and E.B.

Literature

Aljahlan, Y., & Spaulding, T. J. (2021). Attentional shifting in children with developmental language disorder: A meta-analysis. *Journal of Communication Disorders, 91*, 106105. doi.org/10.1016/j.jcomdis.2021.106105

Beitchman, J. H., Wilson, B., Brownlie, E. B., Walters, H., Inglis, A., & Lancee, W. (1996). Long-term consistency in speech/language profiles: II. Behavioral, emotional, and social outcomes. *Journal of the American Academy of Child & Adolescent Psychiatry, 35*(6), 815-825. doi.org/10.1097/00004583-199606000-00022

Bishop, D. V. (2010). Overlaps between autism and language impairment: phenomimicry or shared etiology?. *Behavior genetics, 40*(5), 618-629. doi.org/10.1007/s10519-010-9381-x

Bishop, D. V. (2009). Genes, cognition, and communication: insights from neurodevelopmental disorders. *Annals of the New York Academy of Sciences, 1156*(1), 1-18. https://www.doi.org//10.1111/j.1749-6632.2009.04419.x

Bishop, D. V. M., & Edmundson, A. (1987). Language-impaired 4-year-olds: Distinguishing transient from persistent impairment. *Journal of speech and hearing disorders, 52*(2), 156-173. doi.org/10.1044/jshd.5202.156

Bishop, D. V., Snowling, M. J., Thompson, P. A., Greenhalgh, T., Catalise-2 Consortium, Adams, C., ... & house, A. (2017). Phase 2 of CATALISE: A multinational and multidisciplinary Delphi consensus study of problems with language development: Terminol-

ogy. *Journal of Child Psychology and Psychiatry, 58*(10), 1068-1080. doi.org/10.1111/jcpp.12721

Blom, E., & Boerma, T. (2020). Do children with Developmental Language Disorder (DLD) have difficulties with interference control, visuospatial working memory, and selective attention? Developmental patterns and the role of severity and persistence of DLD. *Journal of Speech, Language, and Hearing Research, 63*(9), 3036-3050. doi.org/10.1044/2020_JSLHR-20-00012

Blom, E., Boerma, T., & de Jong, J. (2020). Multilingual Assessment Instrument for Narratives (MAIN) adapted for use in Dutch. *ZAS Papers in Linguistics, 64*, 51-56. doi.org/10.21248/zaspil.64.2020.557

Boerma, T., Chiat, S., Leseman, P., Timmermeister, M., Wijnen, F., & Blom, E. (2015). A quasi-universal nonword repetition task as a diagnostic tool for bilingual children learning Dutch as a second language. *Journal of Speech, Language, and Hearing Research, 58*(6), 1747-1760. doi.org/10.1044/2015_JSLHR-L-15-0058

Boerma, T., Leseman, P., Timmermeister, M., Wijnen, F., & Blom, E. (2016). Narrative abilities of monolingual and bilingual children with and without language impairment: Impli-cations for clinical practice. *International journal of language & communication disorders, 51*(6), 626-638. doi.org/10.1111/1460-6984.12234

Boerma, T., Leseman, P., Wijnen, F., & Blom, E. (2017). Language proficiency and sustained attention in monolingual and bilingual children with and without language impairment. *Frontiers in Psychology, 8*, 1241. doi.org/10.3389/fpsyg.2017.01241

Bornstein, M. H., Hahn, C. S., Putnick, D. L., & Suwalsky, J. T. (2014). Stability of core language skill from early childhood to adolescence: A latent variable approach. *Child development, 85*(4), 1346-1356. doi.org/10.1111/cdev.12192

Botting, N. (2005). Non-verbal cognitive development and language impairment. *Journal of child psychology and psychiatry, 46*(3), 317-326. doi.org/10.1111/j.1469-7610.2004.00355.x

Botting, N. (2020). Language, literacy and cognitive skills of young adults with developmental language disorder (DLD). *International journal of language & communication disorders, 55*(2), 255-265. doi.org/10.1111/1460-6984.12518

Brus, B. T., & Voeten, M. J. M. (1999). *Een-minuut-test: vorm A en B (EMT)*. Nijmegen, The Netherlands: Berkhout.

Catts, H. W., Bridges, M. S., Little, T. D., & Tomblin, J. B. (2008). Reading achievement growth in children with language impairments. doi.org/10.1044/1092-4388(2008/07-0259)

Chiat, S. (2015). Nonword repetition. In S. Armon-Lotem, J. de Jong, & N. Meir (Eds.), *Methods for assessing multilingual children: Disentangling bilingualism from language impairment* (pp.125–150). Bristol, England: Multilingual Matters. doi.org/10.21832/9781783093137

Clegg, J., Hollis, C., Mawhood, L., & Rutter, M. (2005). Developmental language disorders–a follow-up in later adult life. Cognitive, language and psychosocial outcomes. *Journal of child psychology and psychiatry, 46*(2), 128-149. doi.org/10.1111/j.1469-7610.2004.00342.x

Conti-Ramsden, G., Botting, N., & Faragher, B. (2001). Psycholinguistic markers for specific

language impairment (SLI). *Journal of child psychology and psychiatry, 42*(6), 741-748. doi.org/10.1111/1469-7610.00770

Conti-Ramsden, G., Botting, N., Simkin, Z., & Knox, E. (2001). Follow-up of children attending infant language units: Outcomes at 11 years of age. *International Journal of Language & Communication Disorders, 36*(2), 207-219. doi.org/10.1080/13682820121213

Curtis, P. R., Frey, J. R., Watson, C. D., Hampton, L. H., & Roberts, M. Y. (2018). Language disorders and problem behaviors: A meta-analysis. *Pediatrics, 142*(2). doi.org/10.1542/peds.2017-3551

Dickinson, D. K., & Tabors, P. O. (2002). Fostering language and literacy in classrooms and homes. *Young Children, 57*(2), 10-19.

Dockrell, J. E., & Lindsay, G. (2008). Inclusion versus specialist provision for children with developmental language disorders. In: Norbury, C. F., Tomblin, J. B., & Bishop, D. V. M. (eds). *Understanding developmental language disorders. From theory to practice*, 131-147. London: Psychology Press.

Dockrell, J. E., Lindsay, G., Letchford, B., & Mackie, C. (2006). Educational provision for children with specific speech and language difficulties: perspectives of speech and language therapy service managers. *International Journal of Language & Communication Disorders, 41*(4), 423-440.

Dockrell, J. E., Ricketts, J., Palikara, O., Charman, T., & Lindsay, G. A. (2019). What drives educational support for children with developmental language disorder or autism spectrum disorder: Needs, or diagnostic category?. *Frontiers in Education, 4*, 29. doi.org/10.3389/feduc.2019.00029

Dubois, P., St-Pierre, M. C., Desmarais, C., & Guay, F. (2020). Young adults with developmental language disorder: a systematic review of education, employment, and independent living outcomes. *Journal of Speech, Language, and Hearing Research, 63*(11), 3786-3800. doi.org/10.1044/2020_JSLHR-20-00127

Duinmeijer, I., de Jong, J., & Scheper, A. (2012). Narrative abilities, memory and attention in children with a specific language impairment. *International Journal of Language & Communication Disorders, 47*(5), 542-555. doi.org/10.1111/j.1460-6984.2012.00164.x

Eadie, P., Conway, L., Hallenstein, B., Mensah, F., McKean, C., & Reilly, S. (2018). Quality of life in children with developmental language disorder. *International journal of language & communication disorders, 53*(4), 799-810. doi.org/10.1111/1460-6984.12385

Ebbels, S. H., McCartney, E., Slonims, V., Dockrell, J. E., & Norbury, C. F. (2019). Evidence-based pathways to intervention for children with language disorders. *International journal of language & communication disorders, 54*(1), 3-19.

Ebert, K. D., & Kohnert, K. (2011). Sustained attention in children with primary language impairment: A meta-analysis. *Journal of Speech, Language, and Hearing Research, 54*(5), 1372–1384. doi.org/10.1044/1092-4388(2011/10-0231)

Evans, J. L., & Else-Quest, N. M. (2007). Differences in the nonword repetition performance of children with and without specific language impairment: a meta-analysis. *Journal of Speech, Language, and Hearing Research, 50*(1), 177-195. doi.org/1092-4388/07/5001-0177

Fisher, E. L. (2017). A systematic review and meta-analysis of predictors of expressive-language outcomes among late talkers. *Journal of Speech, Language, and Hearing Research, 60*(10), 2935–2948. doi.org/10.1044/2017_JSLHR-L-16-0310

Gagarina, N. V., Klop, D., Kunnari, S., Tantele, K., Välimaa, T., Balčiūnienė, I., ... & Walters, J. (2012). MAIN: Multilingual assessment instrument for narratives. *ZAS papers in linguistics, 56*, 155-155. doi.org/10.21248/zaspil.56.2019.414

Gallinat, E., & Spaulding, T. J. (2014). Differences in the performance of children with specific language impairment and their typically developing peers on nonverbal cognitive tests: A meta-analysis. *Journal of Speech, Language, and Hearing Research, 57*(4), 1363-1382. doi.org/10.1044/2014_JSLHR-L-12-0363

Gerrits, E., de Jong, J., Zwitserlood, R., & Klatte, I. (2019). The Netherlands. In: Law, J., McKean, C., Murphy, C.-A., & Thordardottir, E. (Eds), *Managing children with developmental language disorder: Theory and practice across Europe and beyond* (1st ed.), Routledge, London, pp. 339-350.

Gilger, J. W., & Kaplan, B. J. (2001). Atypical brain development: a conceptual framework for understanding developmental learning disabilities. *Developmental neuropsychology, 20*(2), 465-481. doi.org/10.1207/S15326942DN2002_2

Hamrick, P., Lum, J. A., & Ullman, M. T. (2018). Child first language and adult second language are both tied to general-purpose learning systems. *Proceedings of the National Academy of Sciences, 115*(7), 1487-1492.

IBM Corp. (2016). *IBM SPSS Statistics for Windows*. Version 24.0. Armonk: IBM Corp.

Johnson, C. J., Beitchman, J. H., Young, A., Escobar, M., Atkinson, L., Wilson, B., ... & Wang, M. (1999). Fourteen-year follow-up of children with and without speech/language impairments: Speech/language stability and outcomes. *Journal of Speech, Language, and Hearing Research, 42*(3), 744-760.

Law, J., McKean, C., Murphy, C.-A., & Thordardottir, E. (2019). *Managing children with developmental language disorder: Theory and practice across Europe and beyond* (1st ed.), Routledge, London.

Leonard, L. B. (2014). *Children with specific language impairment*. Cambridge, Mass.: MIT press.

McArthur, G. M., Hogben, J. H., Edwards, V. T., Heath, S. M., & Mengler, E. D. (2000). On the "specifics" of specific reading disability and specific language impairment. *The Journal of Child Psychology and Psychiatry and Allied Disciplines, 41*(7), 869-874. doi.org/10.1111/1469-7610.00674

McKean, C., Wraith, D., Eadie, P., Cook, F., Mensah, F., & Reilly, S. (2017a). Subgroups in language trajectories from 4 to 11 years: The nature and predictors of stable, improving and decreasing language trajectory groups. *Journal of Child Psychology and Psychiatry, 58*(10), 1081-1091. doi.org/10.1111/jcpp.12790

McKean, C., Reilly, S., Bavin, E. L., Bretherton, L., Cini, E., Conway, L., ... & Mensah, F. (2017b). Language Outcomes at 7 Years: Early Predictors and Co-Occurring Difficulties. *Pediatrics, 139*(3), e20161684. doi.10.1542/peds.2016-1684

Mueller, K. L., & Tomblin, J. B. (2012). Examining the comorbidity of language disorders and ADHD. *Topics in Language Disorders, 32*(3), 228.

doi.org/10.1097/TLD.0b013e318262010d

Nederlands Jeugdinstituut (NJI) (2022). *Cijfers over speciaal onderwijs: cluster 2*. Retrieved from: https://www.nji.nl/cijfers/speciaal-onderwijs-cluster-2.

Norbury, C. F., Vamvakas, G., Gooch, D., Baird, G., Charman, T., Simonoff, E., & Pickles, A. (2017). Language growth in children with heterogeneous language disorders: a population study. *Journal of Child Psychology and Psychiatry, 58*(10), 1092-1105. doi.org/10.1111/jcpp.12793

Pauls, L. J., & Archibald, L. M. (2016). Executive functions in children with specific language impairment: A meta-analysis. *Journal of Speech, Language, and Hearing Research, 59*(5), 1074-1086. doi.org/10.1044/2016_JSLHR-L-15-0174

Rice, M. L., & Wexler, K. (1996). Toward tense as a clinical marker of specific language impairment in English-speaking children. *Journal of Speech, Language, and Hearing Research, 39*(6), 1239-1257. doi.org/10.1044/jshr.3906.1239

Rice, M. L., & Hoffman, L. (2015). Predicting vocabulary growth in children with and without specific language impairment: A longitudinal study from 2; 6 to 21 years of age. *Journal of Speech, Language, and Hearing Research, 58*(2), 345-359. doi.org/10.1044/2015_JSLHR-L-14-0150

Scarborough, H. S., & Dobrich, W. (1990). Development of children with early language delay. *Journal of Speech, Language, and Hearing Research, 33*(1), 70-83. doi.org/10.1044/jshr.3301.70

Schlichting, L. (2005). *Peabody Picture Vocabulary Test—III NL*. Amsterdam, the Netherlands: Harcourt Test Publishers.

Singer, I., Klatte, I. S., Welbie, M., Cnossen, I. C., & Gerrits, E. (2020). A multidisciplinary Delphi consensus study of communicative participation in young children with language disorders. *Journal of Speech, Language, and Hearing Research, 63*(6), 1793-1806. doi.org/10.1044/2020_JSLHR-19-00326

Smeets, E., Driessen, G., Elfering, S. & Hovius, M. (2009). *Allochtone leerlingen en speciale onderwijsvoorzieningen*. Nijmegen: ITS.

Snowling, M. J., Bishop, D. V. M., Stothard, S. E., Chipchase, B., & Kaplan, C. (2006). Psychosocial outcomes at 15 years of children with a preschool history of speech-language impairment. *Journal of Child Psychology and Psychiatry, 47*(8), 759-765. doi.org/10.1111/j.1469-7610.2006.01631.x

Snowling, M. J., Duff, F. J., Nash, H. M., & Hulme, C. (2016). Language profiles and literacy outcomes of children with resolving, emerging, or persisting language impairments. *Journal of Child Psychology and Psychiatry, 57*(12), 1360-1369. doi.org/10.1111/jcpp.12497

Stichting Siméa (2014). *Van vraag naar ondersteuning. Landelijk kader inrichting passend onderwijs*. https://simea.nl/media/richtlijnen/simea-brochure-van-vraag-naar-ondersteuning-nov-2014_.pdf

Stichting Siméa (2016). *Handreiking meertaligheid TOS*. Retrieved from: http://www.simea.nl/dossiers/si166289-simea-handreiking-meertaligheid-tos.pdf

Stichting Siméa (2017). *Richtlijn toelaatbaarheid*. https://simea.nl/media/richtlijnen/simea-

brochure-richtlijn-toelaatbaarheid-20170901.pdf

Stothard, S. E., Snowling, M. J., Bishop, D. V., Chipchase, B. B., & Kaplan, C. A. (1998). Language-impaired preschoolers: A follow-up into adolescence. *Journal of Speech, Language, and Hearing Research, 41*(2), 407-418. doi.org/10.1044/jslhr.4102.407

Schwob, S., Eddé, L., Jacquin, L., Leboulanger, M., Picard, M., Oliveira, P. R., & Skoruppa, K. (2021). Using nonword repetition to identify developmental language disorder in monolingual and bilingual children: A systematic review and meta-analysis. *Journal of Speech, Language, and Hearing Research, 64*(9), 3578-3593. doi.org/10.1044/2021_JSLHR-20-00552

Tomblin, J. B., Zhang, X., Buckwalter, P., & O'Brien, M. (2003). The Stability of Primary Language Disorder: Four Years After Kindergarten Diagnosis. *Journal of Speech, Language, and Hearing Research, 46*(6), 1283-1296. doi.org/10.1044/1092-4388(2003/100)

Tuller, L. (2015). Clinical use of parental questionnaires in multilingual contexts. In Armon-Lotem, S., de Jong, J., & Meir, N. (Eds.), *Methods for assessing multilingual children: disentangling bilingualism from Language Impairment*, (pp. 301-30). Bristol: Multilingual Matters.

Van den Bos, K.P., Lutje Spelberg, H.C., Scheepstra, A. J. M., & De Vries, J.R. (1994). *De Klepel, Vorm A en B. Een test voor de leesvaardigheid van pseudowoorden. Verantwoording, Handleiding, Diagnostiek en Behandeling.* Amsterdam: Pearson.

Verhoeven, L., & Vermeer, A. (2001). *Taaltoets Alle Kinderen* (TAK). Arnhem: Cito.

Vugs, B., Cuperus, J., Hendriks, M., & Verhoeven, L. (2013). Visuospatial working memory in specific language impairment: A meta-analysis. *Research in Developmental Disabilities, 34*(9), 2586-2597. doi.org/10.1016/j.ridd.2013.05.014

Wang, M. (1999). Fourteen-year follow-up of children with and without speech/language impairments: Speech/language stability and outcomes. *Journal of Speech, Language, and Hearing Research, 42*(3), 744-760. doi.org/10.1044/jslhr.4203.744

Webster, R. I., Erdos, C., Evans, K., Majnemer, A., Kehayia, E., Thordardottir, E., ... & Shevell, M. I. (2006). The clinical spectrum of developmental language impairment in school-aged children: language, cognitive, and motor findings. *Pediatrics, 118*(5), e1541-e1549. doi.org/10.1542/peds.2005-2761

Wechsler, D., & Naglieri, J.A. (2008). *Wechsler Nonverbal Scale of Ability.* Purchased from: http://www.pearsonclinical.nl/wnv-nl-wechsler-non-verbal

West, G., Shanks, D. R., & Hulme, C. (2021). Sustained attention, not procedural learning, is a predictor of reading, language and arithmetic skills in children. *Scientific Studies of Reading, 25*(1), 47-63. doi.org/10.1080/10888438.2020.1750618

Wood, P., & Bates, S. (2020). National and international approaches to special education needs and disability provision. *Education 3-13, 48*(3), 255-257. doi.org/10.1080/03004279.2019.1664395

Zambrana, I. M., Pons, F., Eadie, P., & Ystrom, E. (2014). Trajectories of language delay from age 3 to 5: Persistence, recovery and late onset. *International Journal of Language & Communication Disorders, 49*(3), 304-316. doi.org/10.1111/1460-6984.12073