Supporting children with Developmental Language Disorder in Gaelic-medium primary education

Vicky Chondrogianni, Morna Butcher and Maria Garraffa

1. Introduction

The expansion of a minority language use among young learners through immersion education, such as the case of Gaelic in Scotland, relies on the provision of equitable and inclusive services that can cater for children of all abilities. To achieve this goal, it is important that Gaelic-medium education (GME) supports and strengthens the potential of pupils of different abilities, including pupils with developmental language impairments. According to the MacLullich audit on additional support needs (ASN) in Gaelic-medium primary education (GMPE) (MacLullich 2013: 29), pupils with language or speech disorders represent 18% of the ASN school population. However, to date there are no tools to assess GMPE pupils' abilities in Gaelic vocabulary and grammar (Lyon and MacQuarrie 2014; MacQuarrie and Lyon 2019). This can have a long-term impact on whether GME/GMPE is perceived as an inclusive educational choice for children with compromised language abilities and their families. One of the long-lasting myths concerning children with developmental disabilities is that they should not become bilingual. A common fear expressed by parents and clinicians alike is that learning one language is already difficult for these children, so that learning two or more languages would create a burden that exceeds the children's capabilities. Despite lack of scientific evidence pointing towards this negative cumulative effect of bilingualism on language disorders (Genesee and Fortune 2014; Paradis and Govindarajan 2018), this misconception, along with the current shortage of clinical provision and educational support for children with developmental language disorders in GME, could deter parents from choosing GME as their children's educational pathway.

The present chapter briefly presents the premises, design features and preliminary results of a project funded by Bòrd na Gàidhlig in 2017–18 to develop comprehensive language assessments for Gaelic to meet the specific needs of children attending GMPE. The overarching goal of the project was to address current misconceptions regarding bilingual children with and without language disorders in GMPE by implementing the recommendations put forward by the MacLullich (2013) audit on ASN in GMPE related to the educational and clinical support for children with ASN. We adapted to Gaelic language assessments and questionnaires developed during the EU COST Action IS0804 (2008–13) 'Language impairment in a multilingual society: Linguistic patterns and road to assessment.

Previous research with Welsh-English bilingual children attending Welsh-medium education in North Wales' (Chondrogianni and John 2018; Chondrogianni and Kwon 2019) and with other bilingual populations across the UK (Chondrogianni and Marinis 2012; Marinis and Chondrogianni 2010) reported that the available English language assessments are insufficient for addressing the needs of bilingual children. Furthermore, given that any language impairment surfaces across both languages of the bilingual individual, the current gold standard is that both languages should be considered in diagnosis and treatment (Stow and Pert 2015). The development of appropriate tools for Gaelic will allow ASN coordinators and Gaelic-medium teachers to provide comprehensive support to pupils attending Gaelic immersion education and their families (MacQuarrie and Lyon 2018).

2. Children with language disorders in GME in Scotland

GME is an immersion model distinct to Scotland that spans across preschool, primary and secondary education and targets the acquisition of both Gaelic and English with the view to make children fully bilingual by the time they enter secondary education. Gaelic is prioritised in the first three years of GMPE and English is introduced slowly in lessons (O'Hanlon, Paterson and McLeod 2012). Pupils entering GMPE come from a variety of backgrounds. Most pupils come from families with no Gaelic at home and are immersed in Gaelic at school (Stephen et al. 2010). A small proportion of parents (approximately 18%) are native speakers of Gaelic (O'Hanlon et al. 2012). Nursery provision may or may not be attached to school(s) in areas that offer GMPE. As a result, pupils enter primary schools with mixed prior experience of formal instruction in Gaelic. According to the most recent census (2011), only 1.1% of the Scottish population can speak Gaelic, but there was an increase between 2001 and 2011 in the proportion of young people who speak the language (National Records of Scotland 2015: 9). In 2017–18, GME was offered at 53 nurseries, 61 primary schools and 31 secondary schools in Scotland (Bòrd na Gàidhlig 2018: 8–14).

Although the number of children entering GME in Scotland has increased (McLeod 2020: 297–8), the provision of assessments for reading, writing and numeracy in GME has been delayed by two years after the process has begun for English-medium education (MacQuarrie and Lyon 2018). This decision suggests lack of parity between the two educational systems, accentuated further by the lack of (standardised) language assessments for Gaelic. Although children with speech and language disorders constitute 18% of the ASN population according to the MacLullich (2013) audit, there is a lack of assessments for Gaelic that go beyond assessing phonological skills (Lyon 2011). The MacLullich (2013) audit

highlighted the need to develop tools for the identification of language disorders in Gaelic-speaking children in GMPE, as currently teachers and clinicians rely exclusively on informal assessments (Lyon and MacQuarrie 2014).

3. Bilingual children with Developmental Language Disorder

In the present study, we targeted children in GMPE who had or were at risk of Developmental Language Disorder (DLD), a recently coined term for the better-known Specific Language Impairment (SLI). This is a developmental disorder that primarily affects children's abilities to learn, produce and/or comprehend language (Leonard 2014). Although DLD is a prominent developmental disorder affecting approximately 7% of the school population (Norbury et al. 2016), it is less widely known due to its hidden and heterogeneous symptomatology. DLD is a congenital disorder (Bishop and Hayiou-Thomas 2008) and children with DLD have difficulties with oral language despite having normal non-verbal abilities (performance IQ) and hearing, and no obvious neurophysiological impairment (Bishop et al. 2017). Children with DLD are characterised by delayed and/or impaired lexical and grammatical abilities compared to their typically developing (TD) age-matched peers, and may also suffer from poor phonological processing and reduced working memory skills (Schwartz 2017). Problems with language surface at a very young age as preschool children at risk of DLD fail to reach age-appropriate norms in the areas of vocabulary and grammar (Hawa and Spanoudis 2014). Importantly, research in the trajectory of DLD reveals that it is a persistent disorder that continues to affect children's expressive and receptive language skills after school entry, with severe repercussions for their educational outcomes (Conti-Ramsden et al. 2009) and long-term ramifications for their further education and employment opportunities (Conti-Ramsden et al. 2018).

Bilingualism raises unique challenges for children with DLD. This is because bilingual children, regardless of impairment status, constitute a heterogeneous population that may differ in terms of age of exposure, proficiency, dominance, degree and quality of input in their two languages, with bilingual children being more likely to be exposed to non-native input (Fernald, Perfors and Marchman 2006), and educational context, among other things (Chondrogianni 2018). Insufficient knowledge and understanding of how these factors affect bilingual children's performance and, in the absence of standardised assessments containing bilingual norms, *overidentification* of TD bilingual children as language-impaired when they are not and/or *underidentification* of DLD bilingual children as TD when they are language-impaired, remain potential outcomes with adverse clinical and educational repercussions.

What is now better understood is that assessments standardised with monolinguals are usually not suitable for assessing the language abilities of bilingual children (Gathercole 2013; Paradis 2010). This is because when bilingual children with typical development are tested on assessments standardised with monolingual children, they tend to perform within monolingual norms for children with DLD, especially when their exposure to the second language (English in this case) is limited, because the language of schooling or testing may differ from the majority language (English in this case) (Marinis and Chondrogianni 2010; Paradis 2010). Depending on the language area being tested and on the language combination, it may take up to six years for bilingual children in English mainstream education to reach age-appropriate monolingual norms (Paradis and Jia 2017). Therefore, understanding the factors that modulate bilingual development across different language combinations and in different educational contexts is of major clinical and educational importance.

4. Bilingual children with DLD in immersion education

Despite the increase in the number of children who become bilingual through immersion education in the UK (Hickey, Lewis and Baker, 2014; MacQuarrie and Lyon 2018), our understanding of how the educational system interacts with the child's language or learning disability is unclear. Research in this area is both sparse and has given rise to mixed results (Genesee and Fortune 2014). Bruck (1982) examined the literacy and academic achievement outcomes of English-speaking children with language learning disabilities in French immersion and found that they performed at a similar level as counterparts with the same disability in English-only schools. Importantly, the immersion pupils, regardless of language disability, had acquired significantly higher levels of L2 proficiency than students in the monolingual L1 programme who had had conventional L2 instruction. Thomas, Collier and Collier (2011) examined the reading and mathematics achievement of pupils identified with specific learning disabilities or specific language impairment in Grades 3 to 8 attending two-way immersion programs in the United States. Using criterion-referenced and end-of-grade state assessments, they found that the special needs students in the immersion programmes outperformed their peers who were not in these programmes in both reading and maths. Similarly, To, Law and Li (2012) found that Cantonese-speaking children with language disorders attending Putonghua (a Chinese dialect)-medium schools showed similar improvement in their language abilities as their TD peers. These results offer converging evidence that immersion programmes can benefit students with special educational needs in

acquiring language. These results, in combination with further much needed research in this area, can help us dispel misconceptions regarding the relationship between bilingualism and DLD. One such myth is that children with DLD cannot become fully functional bilingual individuals due to limitations in their processing space and cognitive capacity, which are reserved to one but not more languages (Paradis and Govindarajan 2018).

5. Present study: Supporting children with typical development and DLD in GMPE in Scotland

The overarching aim of the present project was to develop Gaelic language assessments for children attending GMPE. These assessments were constructed following the guidelines for the development of the Language Impairment Testing in Multilingual Settings (LITMUS) tasks of the European COST Action IS0804 (2008–13) 'Language impairment in a multilingual society: Linguistic patterns and the road to assessment' (Armon-Lotem, de Jong and Meir 2015). These assessments targeted language areas that have been shown to be vulnerable in children with DLD (single word vocabulary comprehension and production, morphosyntax, narrative ability). At the same time, they offer broad enough guidelines to allow for tasks to target language-specific properties rather than simply translate existing English language tasks. Different LITMUS tasks have already been created across approximately thirty languages of different language families (e.g. Germanic, Semitic and Romance) and community size (e.g. English v. Irish). Gaelic is a welcome addition to this increasing number of LITMUS assessments.

5.1 Vocabulary

Children with DLD are characterised by delayed or impaired lexical abilities, which can potentially serve as an early identification measure of language impairment, when used in conjunction with other measures (Spaulding, Hosmer and Schechtman 2013). Children with DLD may also display weak or divergent semantic networks compared to their TD age-matched peers (McGregor et al. 2002). Bilingual children with typical development tested in one of their two languages appear to know fewer words than their TD age-matched peers and may perform within the range of monolingual children with DLD (Chondrogianni and Marinis 2011). To date, existing single word vocabulary assessments are available for English, and some of them have also been standardised with bilingual children with English as an additional language (Dunn et al. 2006). However, there are currently no vocabulary assessments for Gaelic. Given that bilingual children's lexical knowledge may be distributed

across their two languages (Hoff and Core 2013), not having appropriate assessments for these children renders the domain of lexical development a potential candidate for misidentification of language impairment in bilingual children, with important clinical and educational implications. This is an area that the present study addressed by developing a novel single word vocabulary comprehension and production task for Gaelic following the LITMUS Crosslinguistic Lexical Task (CLT) developed by Haman, Łuniewska and Pomiechowska (2015). The Gaelic CLT was constructed following a three-step process. First, we asked 20 highly proficient speakers of Gaelic to name approximately 350 pictures depicting objects (nouns) and actions (verbs). The same participants were also asked to state when they thought they had acquired these Gaelic words (Łuniewska et al. 2019). At a second stage, the pictures with the higher name agreement were rated on the basis of their morphological and phonological complexity by a Gaelic language scholar, and a complexity index was computed (CI). As a third and final step, we computed a score for each word on the basis of their CI and their age of acquisition (AoA). Using this score, we selected the targets and potential semantic and/or AoA distractors to construct the production and comprehension versions of the Gaelic CLT (Chondrogianni, Butcher and Cox 2018). For example, a noun such as *seilcheag* 'snail' received high complexity and AoA scores, whereas the word *bròg* 'shoe' received low complexity and AoA scores (see more in section 5.4.2).

5.2 Morphosyntactic abilities

Morphology and syntax are the two language areas whose development is particularly vulnerable in children with DLD (Leonard 2014). However, there are differences in which linguistic properties are vulnerable across languages. For example, tense and agreement verbal morphology are particularly problematic for English-speaking children with DLD, both monolingual and bilingual, regardless of the educational context (Chondrogianni and Kwon 2019; Paradis and Jia 2017) to such a degree that they are considered *clinical markers* (Rice and Wexler 1996). That is, performance on tense and agreement alone (third person *-s*, past tense *-ed*, copula and auxiliary *BE*) can differentiate TD from DLD children. In contrast, in languages with a richer morphology compared to English, such as Italian, Greek or Spanish, tense and agreement morphology are not considered clinical markers (Leonard 2014).

To date, we know very little about the developmental trajectory of Gaelic in children whose first language is Gaelic or who learn Gaelic through immersion. Hence, the aim of the present study was twofold: to document the development of various areas of Gaelic

morphosyntax in TD and DLD children after at least one year of formal immersion to Gaelic, and to identify linguistic aspects of Gaelic that are potentially problematic for children with DLD attending GMPE. We addressed these aims by adopting the guidelines of the LITMUS sentence repetition task (SRT) (Marinis and Armon-Lotem 2015) to develop a similar task in Gaelic, and we targeted areas of Gaelic that could potentially be problematic given the existing literature on the development of morphosyntax in other Celtic languages, such as Welsh (Chondrogianni and John 2018). In an SRT, participants hear a sentence and are asked to repeat it. Performance can be evaluated on the basis of verbatim repetitions, proportion of errors and/or whether or not participants preserved the target structure. We targeted areas of morphosyntax specific to Gaelic, such as Verb-Subject-Object word order, as well as more complex structures, such as relative clauses and question formation, which have been independently shown to be problematic in children with DLD (Leonard 2014; Schwartz 2017). Table 1 presents examples of the structures targeted in the Gaelic SRT.

Structure **(6 Items per structure)**	**Sample sentence**
VSO	Ruith e dhachaigh bhon sgoil feasgar an-dè. ran he home from the school afternoon yesterday *He ran home from school yesterday afternoon.*
VSO with negation	Cha do sheinn e leis a' chòisir an-dè. did not sing he with the choir yesterday *He did not sing with the choir yesterday.*
VSO modal	Dh'fheumainn na leabhraichean a leughadh san leabaidh. I would have the books to read in the bed *I would have to read the books in bed.*
Passives	Chaidh na h-ùbhlan ithe leis a' chlachair. went the apples eaten with the builder *The apples were eaten by the builder.*
Sentinel adjuncts	Ma ghlanas tu na soithichean, thèid sinn dhan tràigh a dh'aithgh if clean you the dishes, will go we to the beach soo *If you do the dishes, we will go to the beach soon.*
Object relative clauses	Chòrd an geama a chluich na balaich an-dè riutha. enjoyed the game played the boys yesterday to them The boys enjoyed the game they played yesterday.
Questions (Dè/Cò)	Cò am balach ris an coinnich am post aig an doras? Which the boy to meet the postman at the door? Which boy will the postman meet at the door?

Table 1. Structures and sample sentences targeted in the Gaelic version of the LITMUS-SRT

5.3 Narrative development

Narrative skills are important for later success in school, even in subjects not related to language, such as mathematics. The ability to construct and tell a story draws not only on linguistic competence but also on cognitive and pragmatic abilities, what has been coined as macrostructure. These abilities develop during the early school years and become more complex and elaborate throughout childhood. Children with DLD have been shown to have problems not only with microstructure, as expected given their compromised language abilities, but also with macrostructure, that is the ability to construct elaborate narratives. In the present study, we adapted to Gaelic the four narratives developed in the COST Action IS0804 known as Multilingual Assessment Instrument for Narratives (LITMUS-MAIN) (Gagarina et al. 2015). LITMUS-MAIN involves story-telling and retelling with the use of child-friendly visual prompts. Children were assessed on story grammar, namely children's ability to structure stories with different episodes, where they stated the goal, attempts and outcomes of the protagonists' actions, their mental state and thoughts, as well as on comprehension questions targeting the content of the story.

5.4 Preliminary results

In the following section, we present some preliminary results on children's performance on the comprehension and production of single word vocabulary of the Gaelic-CLT. We asked the following research questions.

1. Is bilingual children's performance on Gaelic single word vocabulary modulated by word class (nouns v. verbs) and modality (comprehension v. production)?
2. How do children with DLD compare to their TD age-matched control on their vocabulary abilities?

5.4.1 Participants

Fifty-six six- to eight-year-old children participated in the study. Children were attending Primary 2 and Primary 3 in GMPE in four different local authorities in Scotland. Thirty-two children were from English-only homes and twenty-one from English and Gaelic homes, and no parental questionnaires were returned for six children. Fifty-two children were classified as typically developing (mean age (in months): 88.2, range: 73-98, SD:6.9) and four as having or being at risk of DLD (mean age (in months): 88.3, range: 81-93, SD: 8.7). The DLD/at risk status of the children was confirmed by testing them in their dominant language (English), following the Royal College for Speech and Language Therapy recommendations on bilingual children (Stow and Pert 2015). To that end, we established the children's clinical

status based on a combination of their performance on the CELF screener (Semel and Wiig 2017), as well as through the LITMUS parental questionnaire adapted to the GMPE context (Tuller 2015) and informal discussion with the teachers and parents at the school. We focused on primary school children attending P2 and P3 in GMPE, looking at their language abilities and their language history in both Gaelic and English, as we wanted to make sure that they had some exposure to Gaelic (at least one year at the time of testing).

5.4.2 Materials

To assess children's single word vocabulary production and comprehension in Gaelic, we developed the Gaelic version (Chondrogianni et al. 2018) of the LITMUS-CLT (Haman et al. 2015) described in section 5.1. In the production task, children saw a panel with the picture of an object, or an action and they were asked to name it. In the comprehension task, children were shown a four-picture panel with objects or actions containing the target, two semantic distractors and an unrelated distractor. They would hear a word and they were asked to point to the picture that matched the word they heard. There were 64 items per modality (comprehension, production), 32 nouns and 32 verbs across modalities.

5.4.3 Procedure

Children were tested in their schools in both English and Gaelic across four sessions by bilingual Gaelic-English-speaking research assistants. Ethical approval by the School of Philosophy, Psychology and Language Sciences of the University of Edinburgh and permission by the relevant local authorities was obtained at the beginning of the study.

5.4.4 Results

Figure 1 presents children's performance on the production and comprehension of single word vocabulary in Gaelic.

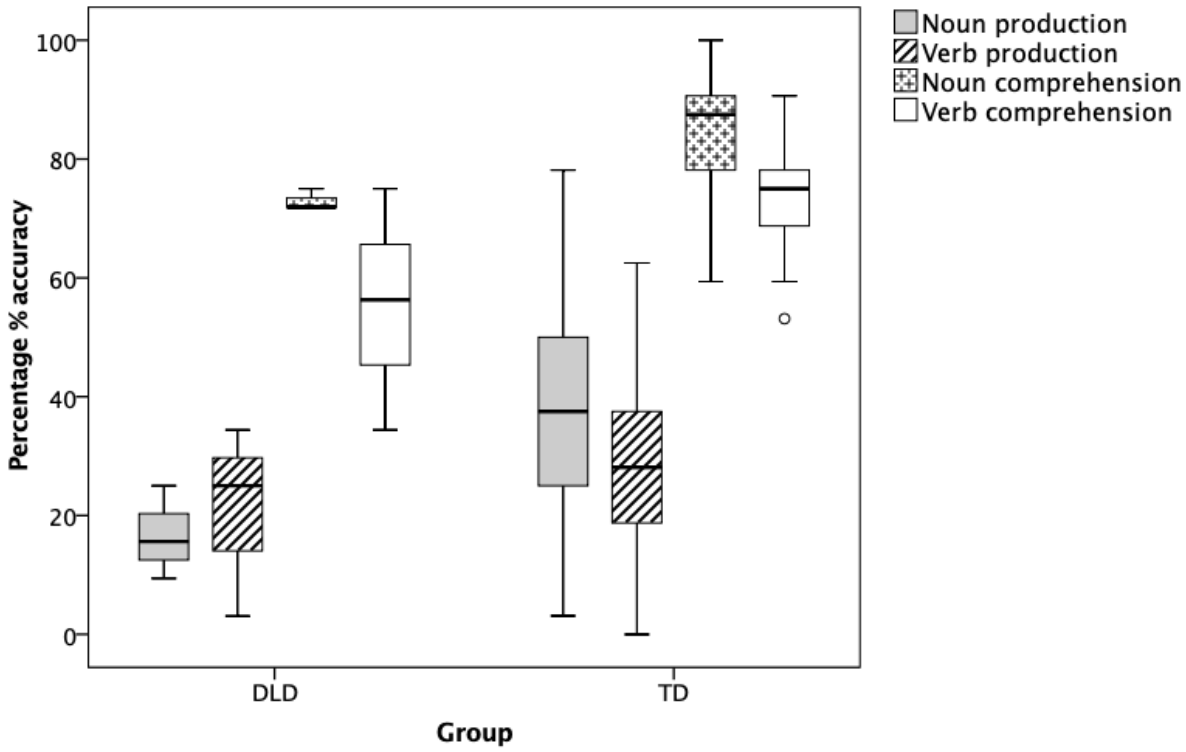

Figure 1. Production and comprehension of verbs and nouns by the Gaelic-English-speaking children with typical development (TD) and Developmental Language Disorder (DLD)

To examine whether the two groups differed on their vocabulary skills, we ran a repeated-measures ANOVA with word class (nouns, verbs) and modality (comprehension, production) as the within participants factors and Group (DLD, TD) as the between groups factor. Results showed a main effect of Modality ($F(1,51) = 150.7$, $p < .0001$,$\eta^2 = .75$), Word Class ($F(1,51)=12.54$,$p<.0001$,$\eta^2=.19$), and a three-way interaction between Modality, Word class and Group ($F(2,51)=8.6$,$p<.01$,$\eta^2=.09$). The interaction was due to the TD children having higher accuracy on nouns vs. verbs on both the comprehension and production task ($F(1,49)=91.38$,$p<.0001$,$\eta^2=.65$), whereas the DLD children did not show a difference between nouns and verbs in either the production or the comprehension task ($F(1,2)=.53$,$p-.54$,$\eta^2=.21$). Overall, both groups had higher accuracy on the comprehension compared to the production task (DLD: $F(1,3)=30.02$,$p<.05$,$\eta^2=.94$; TD: $F(1,49)= 674.91$,$p<.0001$,$\eta^2=.93$).

6. Discussion

The goal of the research project briefly presented here was to assess the language abilities of typically developing and language-impaired children attending GMPE in Scotland by

developing level-appropriate language tasks, especially for Gaelic. Bilingualism raises unique challenges for children with DLD, as well as for educators and clinicians that interact with bilingual children. This is due to a multiplicity of frequently interrelated factors. Among other things, these may be parents' and professionals' incomplete knowledge about how specific language combinations affect bilingual language development or how bilingual development is expected to surface even in TD children. Lack of age-appropriate language assessments to evaluate children's language abilities across their two languages may lead to delay to refer the child for further evaluation, or to overrepresent children in evaluation/treatment. The development of new Gaelic language assessments and the preliminary results on lexical development in TD and DLD children is, therefore, of eminent importance.

Given the paucity of language assessments targeting Gaelic, we wanted to develop linguistically informed assessments for Gaelic that would not constitute mere translations of existing English language assessments. Second, to understand which areas of Gaelic are problematic for children with DLD, we need to know first how Gaelic develops in TD children attending GMPE. We, therefore, tested both TD and DLD children of the same age and language background. In the present study, we also focused only on children from Gaelic or English background, having to exclude children speaking other languages to ensure that we are getting a clear picture of the development of English and Gaelic.

The preliminary results of the Gaelic CLT (Chondrogianni et al. 2018) developed for this Bòrd na Gàidhlig-funded project showed that DLD children knew fewer words in Gaelic than their TD peers in GMPE, a finding in line with what has been reported about the language abilities of DLD children acquiring different languages (Schwartz 2017). Both groups also exhibited better comprehension than production skills. Interestingly, the TD children had better knowledge of nouns compared to verbs regardless, a finding reported in other languages (Haman et al. 2015), but this was not the case with the DLD children. Given the small sample size, this is a finding that would need to be better confirmed in future research. Importantly, no group showed ceiling performance on these tasks, which suggests that the assessments have the potential to capture developmental differences beyond P2 and P3 that need to be further investigated in future studies.

7. Conclusions and future directions

The development of language- and age-appropriate material that address the specific needs of bilingual children in GME remains an urgent issue. The present study tried to address this

gap by focusing on children with DLD in the first three years of GMPE. In the first step towards this direction, we focused on children attending GMPE from an English-speaking background in a small-scale study. Given the promising evaluative and diagnostic potential of the assessments developed in this project, we will seek in future studies to extend them to older children attending P4-P7 to establish when TD children in GMPE reach ceiling performance on these assessments. We also plan to test a larger sample of children with DLD and with potentially other disorders to fully unravel the diagnostic potential of these assessments.

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